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ABSTRACT

Guidelines to help communities reach the third and fourth National Education Goals are presented in this document. The third goal states that by the year 2000, American students will leave grades 4, 8, and 12 having demonstrated competency in challenging subject matter including English, mathematics, science, history, and geography, and that every school will ensure that all students learn to use their minds well, so they may be prepared for responsible citizenship, further learning, and productive employment. The fourth goal states that U.S. students will be the first in the world in science and mathematics achievement. The introduction discusses eight principles that communities can apply to create outstanding schools: raise expectations; establish high standards; create high-quality tests to measure students' progress; increase parental involvement; dedicate greater time and effort to learning; improve instruction; reinvent teaching and learning; and provide school choice. The second section describes various community programs, the third section lists relevant resource groups, and the fourth section offers suggestions for further reading. Documents for setting academic standards are listed in the final section. (LMI)

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AMERICA 2000

ISSUES

U.S. DEPARTMENT OF EDUCATION

What Other Communities Are Doing....

National Education Goals 3 & 4

By the Year 2000:

American students will leave grades four, eight, and twelve having demonstrated competency in challenging subject matter including English, mathematics, science, history, and geography; and every school in America will ensure that all students learn to use their minds well, so they may be prepared for responsible citizenship, further learning, and productive employment in our modern economy.

&

U.S. students will be first in the world in science and mathematics achievement.

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NATIONAL EDUCATION GOALS 3 AND 4 in many ways point toward our highest aspirations as a society. We want all our children to "demonstrate competency in challenging subject matter." We want them to "learn to use their minds well," to be prepared for "responsible citizenship, further learning, and productive employment." To achieve these ends and to meet the challenges of a global economy, we want them to be first in the world in math and science.

These goals express an ideal upon which the strength and future of our republic depend. Yet today we stand a world apart from that ideal. Today, we realize that in order to change our country, we must change our schools. We need to create the best schools in the world so that our children will be prepared to meet the challenges of a new century.

There's no shortage of alarming reports about where we are today in education:

Two out of three 17 year-olds cannot place the Civil War in the correct half century.

- Only 37 percent of American 18 to 24 year-olds can find France on a map. Even fewer can find England or Spain.
- Only a third of 11th graders can write an adequate persuasive letter.
- American students consistently rank dead last or near last among industrialized nations in international math and science comparisons.

America has a serious education problem. Our students don't know enough and can't do enough. And just about the biggest obstacle to a revolution in education in any community is complacency. Too many parents in too many neighborhoods believe that while the nation is at risk, *their own children* are okay. Of course, it isn't true. Certainly some children perform better than others, but our children don't know enough and can't do enough to meet the challenges of the next century. Even our *best* math students—those enrolled in Advanced Placement classes—perform below the *average* Japanese student.

That's why a national crusade is underway—a revolution in the way we think about teaching and learning—to secure our future and our children's future.

AMERICA 2000 is about communities coming together in an unprecedented way to reach the National Education Goals established by the President and the Governors in 1990. Currently over 1,500 communities are already using the *AMERICA 2000* framework to create strategies to transform their schools to help

all students learn English, math, science, history, geography, and other important subjects.

Common Principles of Community Strategies
Education research, common sense, and the experience of many communities point to at least eight principles communities can apply to create outstanding schools for their children:

1. Raising expectations.
2. Establishing high standards for what all children should know and be able to do.
3. Creating high-quality tests to measure students' progress.
4. Increasing parental involvement.
5. Putting more time and effort into learning.
6. Improving instruction.
7. Breaking the mold: reinventing teaching and learning.
8. Giving families more choices among schools.

1. Raising Expectations
One reason we're falling behind is that we expect too little. For students to excel, we must *expect* them to excel. Education scholar Diane Ravitch says, "The best way to level the education playing field is to create higher expectations for everybody.... We just multiply kids' disadvantages when we expect so little of them."

The simple, powerful conviction that all children can excel is at the core of Jaime Escalante's brilliant career as a high school math teacher in California. Working with poor, Hispanic underachievers at Garfield High in East Los Angeles, Escalante combined his untiring belief in the ability of his students with his exceptional skills as a teacher, and successfully prepared them for the challenging Advanced Placement Calculus test. By the time Escalante left Garfield, 576 of his students had passed the AP Calculus test.

Escalante disproved the skeptics and inspired the nation by demonstrating beyond any doubt that *all* students are capable of achieving at high levels.

2. Higher Standards
If kids are to aim high, it's up to adults to give them clear targets to put in their sights. Children everywhere can benefit from nationally recognized standards of what they need to know and be able to do in core subject areas such as English, math, science, history and geography. And high standards can help drive other necessary changes—improvements in student assessment, instructional materials, teacher training, and more.

Right now, communities have standards by default—dictated by textbook writers and test publishers—not through a realistic consensus of what all students need to learn to be prepared for responsible citizenship and productive employment. If a textbook isn't geared to World Class Standards, even mastering all of its contents may not be enough to match competitors abroad. In fact, America is nearly alone among industrialized nations in having no national standards for what children need to know and be able to do in core subject areas.

Happily, this situation is changing quickly. This year, the National Council on Education Standards and Testing (NCEST), a bi-partisan group of educators, elected representatives, and public officials, issued *Raising Standards for American Education*, a report strongly endorsing national education standards and a voluntary nationwide system of examinations to measure progress towards those standards. The broadly supported NCEST recommendations point to a movement already sweeping the nation to create national standards.

North Carolina's Charlotte-Mecklenburg school district has emerged as a pacesetter on standards by assembling national education experts to develop ambitious goals for its schools.

At the national level, math teachers are leading the charge. In 1989, the National Council of Teachers of Mathematics issued America's first-ever national standards for mathematics. Already, these standards have affected instruction in over 30 percent of America's classrooms.

In addition, many states have developed curriculum frameworks that communities may use to help their students learn more and be able to do more. The State of California, for instance, has developed challenging curriculum frameworks in major subjects, including history-social science, English and language arts, mathematics, science, foreign language, and visual and performing arts.

In Fort Myers, Florida, the Three Oaks Elementary School rebuilt its curriculum around a rigorous core of knowledge and saw grades, attendance (for both students and teachers), and test scores rise sharply after only one year. Some 50 schools this year are following the lead of Three Oaks Elementary School, redesigning their curriculum around E.D. Hirsch's "Core Knowledge Sequence."

3. Measuring Progress

If national standards tell us *what* our children need to know and be able to do, voluntary national tests will tell us *how well* they know and can do it. Japan,

Germany, and our other economic competitors have achievement tests that measure their students' performance in relation to national standards. More and more Americans believe it's time we did too.

Yet another indicator that our perspective needs adjustment is the discovery in the 1980s, by Dr. John Cannell, of the "Lake Wobegon Effect" whereby every state in the union reported scoring *above the national average* at the elementary level on several widely used commercial tests!

One of the most powerful ideas of *AMERICA 2000* is that the nation needs to have a reliable method of assessment using tests set to World Class Standards. The American Achievement Tests (AAT)—a voluntary national system of examinations in grades 4, 8 and 12—will help communities cast a bright light of scrutiny on all students *equally*. These tests will be trustworthy and fair measures that will actually measure what students are supposed to know and be able to do rather than vocabulary, logic puzzles, and IQ.

The American Achievement Tests will not be just another battery of tests for statisticians to ponder tests that students regard as another tedious interruption in their routine with results that do not affect them personally. Communities can make these tests count. Teachers can use them as an honest measure of success in the classroom. Trade schools, universities, and employers may use the results in admission or hiring decisions.

A number of communities are not waiting for the AATs to be ready. In Littleton, Colorado, Littleton High School is using writing portfolios, oral presentations, and other performance-based assessments—rather than "seat time"—to determine whether students are ready to advance and graduate. The New Standards Project, a joint effort by the National Center on Education and the Economy and the Learning Research and Development Center at the University of Pittsburgh, is helping communities in 17 states develop performance-based assessments that teachers use to improve instruction.

4. Parental Involvement

We all know at least some of the reasons that American students aren't learning enough. We know our children watch too much TV and do not do enough homework. Most 13-year-olds watch about three and a half hours of television a day but spend less than an hour doing homework. Nonetheless, many people are surprised to learn that most high school seniors read no more than 10 pages a day, both at home and at school, for all classes combined.

We are raising a generation of experts on running shoes, video games, and rock music. And while American children are playing Nintendo, Japanese children are learning the math they'll need to design better video games.

So reaching Goal 3 probably means reordering our priorities and exerting more effort. That effort begins at home.

Research by sociologist James Coleman has demonstrated that a key factor in children's success in school is having parents who are *involved* and *interested* in their education. Yet a 1992 survey found that only 43 percent of parents are "*somewhat* involved" in preparing their children for school and for schoolwork. Fourteen percent are "heavily involved," 24 percent "rarely involved," and 18 percent "not at all involved."

An analysis of national data gathered by the Education Testing Service this year indicates that parents who do the following simple things significantly improve their children's performance on exams:

- talk to their children regularly about their school work;
- restrict their children's television watching on weekdays;
- ensure adequate after-school supervision for their children;
- know the parents of their children's friends.

More and more, schools and parents are figuring out ways to work together better and more often.

In Newton, North Carolina, a hosiery manufacturer, Ridgeview, Inc., allows counselors from the local schools to hold parent conferences at the workplace with its employees. The school counselors are able to reach many parents for the first time, and involvement by fathers has soared. As one school official put it, "we meet parents on their own turf, and it costs us nothing but our time."

In addition, San Diego has become the first large, urban district to officially adopt a parent involvement policy. The district now employs a Parent Involvement and Support Specialist, who provides planning and resource materials to help schools attract and develop parental support.

Hundreds of communities have begun using technology to increase communication between schools and home. In Montgomery County, Maryland, several schools are using voice mailboxes for teachers, so that parents can call to get their child's homework assignment. One of those schools, Burtonsville Elementary, received more than 750 calls the first week. And one Burtonsville teacher estimated that nearly 100 percent of her students were turning in homework on time.

5. More Time Learning
Both research and common sense tell us that the more time you spend learning, the more you are likely to learn. Consequently, a growing number of states are talking about lengthening the school year.

Oregon is increasing its school year to 220 days by the year 2010, and students in Detroit's Cornerstone Schools, run by a coalition of the city's churches, now spend as many days in school as Japanese students do—240 days, a full 60 days above the U.S. average.

Forty percent of children in Murfreesboro, Tennessee arrive at school early or stay late for crafts, games, field trips, foreign language studies, and more.

6. Better Instruction
Expecting more from students means expecting more from ourselves—more from parents and more from *teachers*.

Many teachers may want to take advantage of the national teacher certification system being developed by the National Board for Professional Teaching Standards. This system's first teacher assessments are expected to be ready by 1993.

One simple way that communities are improving the quality of instruction is by expanding the pool of talented educators available to schools through alternative certification. Alternative certification gives principals and administrators greater flexibility and scope in hiring and enables school leaders to build teams of educators that suit their schools. In recent years, many states, most notably New Jersey, have taken steps to open their schools to a wider variety of professionals.

The Departments of Defense and Education have seized the opportunity of the Pentagon's downsizing to recruit highly trained teachers for America's schools from the nation's armed forces. The Education Department will help identify alternative certification programs that retiring or separating service men and women can take advantage of, while the Defense Department will provide them with any additional training they may need to become teachers.

Regardless of who is teaching in their classrooms today, most states and communities recognize that teacher training is essential if teachers are to help all students reach the emerging World Class Standards. Many are going ahead and expanding opportunities for teachers to upgrade their knowledge and skills through summer workshops, research in commercial labs, and more.

The Southwest Teachers Academy of Physics at the University of Dallas, along with 17 other academies for teachers and principals, have been established with support from the U.S. Department of Education's Fund for the Improvement of Education. (A number of other efforts are mentioned in the individual subject sections in the second half of this backgrounder).

7. Breaking the Mold: Reinventing Teaching and Learning

The basic design of our schools hasn't changed in over 200 years. Dramatic change is needed to bring about a large-scale renaissance in teaching and learning.

A number of "reforms" were attempted in the past decade, but many were too timid and too piecemeal. A parent involvement program added. A science curriculum improved. A writing workshop conducted. These reforms address only one problem at a time. But many communities have become impatient with "tinkering at the margins." They want radical change—not just here and there, but comprehensive and system-wide.

The non-profit New American Schools Development Corporation announced in July its selection of 11 national Design Teams, 11 sets of blueprints that can help create a new generation of American schools. These teams will help communities start from scratch and literally reinvent schools for the next century.

Among the teams selected was the Bensenville, Illinois, Community Design Team, which intends to transform its entire community into a campus for learning. Students may be able to study mathematics at the local bank in the morning, for example, then learn writing at the town newspaper in the afternoon.

Another team, The Modern Red Schoolhouse of Indianapolis, combines a back-to-basics approach with state-of-the-art technology and an individual education plan for each student. Grade levels will be abolished; instead, students will progress as they master challenging material in core subjects areas.

8. More Choices of Schools for Families

Most Americans believe that all families ought to have more of the same choices among schools that well-off families have always had. As a result, more and more states are giving families greater choices in the schools their children attend.

Our nation is blessed with a tremendous variety of schools that serve the public interest by educating children to become responsible, literate citizens. There are science and technology schools, military academies, boarding schools, performing arts schools, Catholic schools, Jewish schools, Montessori schools, big schools and small schools among others. The idea behind choice is to help families find the school that's best for the child rather than making the child fit the school.

Choice introduces elements of the free market into our current system of state-run government monopolies. It gives families the consumer power—dollars to spend at any school they choose—which is the muscle parents need to transform our education system. Consequently, good schools will welcome choice, and poor schools must take bold steps to improve.

The demand for more choice is stronger than ever. In 1991 alone, 37 states saw choice legislation submitted for consideration. And some 13 states now have choice in some form. Public opinion—especially among minorities and low-income Americans—strongly favors choice; and in recent years, grassroots coalitions promoting choice have sprung up in states from coast to coast. At the national level, President Bush recently announced the GI Bill for Children, which would provide $1,000 scholarships to middle and low-income families so that their children can attend the schools that best fit their needs, rather than the schools to which they were assigned.

In 1990, Polly Williams, a black civil rights activist and Wisconsin state legislator, won the passage of a parental choice program for Milwaukee children from low-income families. The program in Milwaukee, whose backers include the governor, mayor, and school superintendent, permits K-12 low-income students in that city to attend any nonsectarian private city school, with the state paying up to $2,500 per child.

Some communities aren't waiting for their state or local government to pass choice programs and are creating their own. In San Antonio, a bank, a high-tech firm, and a local newspaper have joined forces to provide $750 vouchers for 840 children from low-income families to attend the public or private school of their choice. Patterned after a similar effort in Indianapolis funded by the Golden Rule Insurance Company, San Antonio's Children's Educational Opportunity Foundation represents a radical departure from the way we usually select and pay for our children's education.

Transforming Education, Subject by Subject

Armed with those powerful principles for transforming education, communities are taking the next step and developing community-wide strategies to meet Goals 3 and 4 by applying these principles to each of the key subjects at every grade level.

ENGLISH

English includes three interconnected subject areas—reading, writing, and literature.

Reading is a key to success in school and to learning throughout life. It is indispensable for learning about the past and present. Writing is a means for communicating our thoughts and for transmitting what we have learned. Literature teaches us about man's great struggles and about the contest of good and evil in the human soul. Mastering these three areas is essential for gaining facility with language—one of the most important tools for work, citizenship, and "the pursuit of happiness" in our society.

Today, many students are emerging from our schools without proficiency in English.

- A mere 5 percent of 17 year-olds read well enough to understand and use information found in literary essays, historical documents, and college-level texts.
- On almost all NAEP writing tasks the majority of 12th graders are unable to give adequate responses.
- Only 17 percent of 17 year-olds could say who wrote *Crime and Punishment*. And most college seniors cannot match the works of Shakespeare, Plato, Dante, and Milton with their authors.

It's no wonder, considering how little time most of our students spend reading and writing. Nearly half of 12th graders say they read "for fun" less than once a month. And most write two papers or fewer during a typical six week period of school.

Many communities have decided that more time devoted to reading and writing is essential. In Burr Ridge, Illinois, the Elm Elementary School has made writing a key ingredient to learning every subject, and it shows: In state-wide testing conducted by Illinois last year, the writing performance of Elm Elementary students was the "most improved" in the state.

Similar trends are evident on the West Coast as well. At the 99th Street Elementary School in the heart of Los Angeles' Watts neighborhood, basal readers, along with remedial instruction and low expectations, have been tossed out. Instead, students read real stories and books, like the libretto from Rossini's *Barber of Seville*, and learn spelling by reading poetry instead of workbooks.

Many communities are beginning to rethink what they want their students to know and be able to do in reading, writing, and literature. These communities are looking at various standards and curriculum frameworks, including the *English-Language Arts Framework for California Public Schools*, the *Core Knowledge Sequence*, and *Reading Objectives for the 1990 National Assessment of Educational Progress*. (For more information, see Documents for Setting Standards Today, p. 83)

In addition teachers at many schools provide students and parents with book lists to guide students to key titles and authors. In California, teachers have developed book lists for all grades, which many schools and parents have found useful. Organized by age-level, these book lists include titles and authors from many cultures, and identify books that California teachers believe all students should read.

Many English teachers are going back to school to enhance their skills in helping students read and write better. Teachers from thousands of schools across the country are spending part of their summers improving their ability to teach writing. The National Writing Project, a network of schools and universities based at the University of California, Berkeley, brings teachers to university campuses around the country for intensive five-week workshops.

MATHEMATICS

Known as the language of science, mathematics helps us understand and communicate about the natural world. Not only is mathematical literacy needed to function in everyday life, it is also essential for understanding issues in a society and global economy where science and technology play increasingly prominent roles.

Yet the National Assessment of Educational Progress found that not even one in five American students is "competent" in mathematics. NAEP also found that:

- Fewer than half of 12th graders and only 14 percent of 8th graders have a grasp of topics generally introduced by the 7th grade—fractions, decimals, percentages, and simple algebra.
- Only 6 percent of 11th graders are able to solve such problems as calculating the amount of simple interest owed on a loan after one year.
- Only 5 percent of 12th graders understand geometry and algebra well enough to study more advanced math.

International comparisons are more troubling still. U.S. students consistently rank at or near the bottom in both mathematics and science achievement among industrialized nations. Our bottom 10 percent perform below the bottom 10 percent in 15 other countries, except Jordan. And our *best* rank below the *average* Japanese. Clearly, we have a long way to go to become first in the world in math—the first half of National Education Goal 4.

Part of our problem is low expectations that aren't limited to the classroom. Our society tends not to attach any real stigma to "innumeracy" while we certainly do to illiteracy. We all know the restaurant scene when the check arrives: "I'm *terrible* at math <chuckle>—can someone please figure out what each of us owes?" Ironically, the stigma is more likely to fall on the unlucky individual who volunteers to perform the arithmetic. Can anyone imagine having the same casual attitude about not being able to read a menu?

A growing number of communities are tackling that problem by requiring all students to study more mathematics. Dunbar High School in Dayton, Ohio, decided last year to require nearly all of its 400 ninth graders to take algebra, the "gatekeeper" to advanced mathematics.

Children at Davis Elementary School in Gresham, Oregon, willingly abandon the playground to attend "Recess Math." Using computers and mathematical games, these sessions during recess and before and after school have become so popular that kids must be turned away. Math scores at Davis Elementary have climbed 20 to 30 percent above the county average since Recess Math began.

Requiring algebra and teaching math during recess are great steps. But most communities recognize that math standards and instruction in all classrooms must be transformed.

The National Council for Teachers of Mathematics (NCTM) recognized this more than a decade ago and began talking about what all students should know and be able to do in math. Those discussions led to the establishment of the NCTM *Curriculum and Evaluation Standards for School Mathematics*. The "math standards," as they're often referred to, were issued three years ago and have since been endorsed by countless groups. The math standards have set the pace for teachers in other disciplines, by emphasizing a practical approach where students spend much of their time solving problems and learning to think mathematically. (For more information, see Documents for Setting Standards Today, p. 84)

This method resembles in some respects what happens in Japanese classrooms, where some of the world's current top-performing math students are found.

Japanese teachers present students with practical problem-solving sessions first, and only gradually introduce formal concepts. For example, a teacher will bring in an armful of containers of various shapes and sizes, and get the students to try to figure out which will hold the most water. Only at the end of the class does the teacher attach labels and formulas to the concepts of "measurement" and "volume".

Part of the challenge of carrying out the NCTM's mathematical standards is that our teachers were not trained to teach that way. Only 18 percent of elementary school teachers, and 14 percent of middle school teachers meet professional standards in mathematics. And only 42 percent of math teachers in our high schools today have degrees in mathematics.

A number of states and communities are zeroing in on teacher training. California is carrying out massive middle school teacher training called the Math Renaissance Project. In Orange County, Florida, teachers who are becoming "math specialists" will share what they've learned with K to 3 teachers throughout the district, helping those teachers plan imaginative lessons and use the latest teaching techniques.

Mission High School in San Francisco was among the first schools to implement the NCTM Standards. Mission High's three-year curriculum engages students in complex "real-life" scenarios. The result has been a marked increase in student interest and participation. And every student taught according to the new standards at Mission has elected to take a fourth year of math.

SCIENCE

We all want our children to develop the habit of thinking scientifically—defining problems, developing hypotheses to solve them, testing their hypotheses. But today, surveys reveal that:

- Only 51 percent of 8th graders know that the sun rises in the east and sets in the west.
- Only 7 percent of 17-year-olds have the knowledge and skills in science needed to learn in college-level science courses.
- As with mathematics, international science comparisons find the U.S. at or near the bottom among industrialized nations.

One reason that our students fare poorly on international comparisons is that they don't spend enough time studying science. Only 17 percent of American high school graduates complete courses in biology, chemistry, and physics.

Children in grades K to 3 receive no more than one and a half hours of science per week; grades 4 to 6 get an average of two and a half hours per week. In middle schools, the average amount of science instruction is three hours or fewer per week.

Another problem is inadequate teacher preparation. A third of the people teaching science in our high schools didn't major in it. According to the National Science Teachers Association, only 44 percent of elementary teachers and 22 percent of middle school teachers are adequately prepared to teach science.

Perhaps the greatest obstacle to improving performance in science is that we haven't been clear about exactly what students need to know and be able to do. This situation is beginning to change. The National Academy of Sciences is leading a national effort to define what scientific knowledge and skills students need. The Academy expects to produce these science standards by the end of 1994. However, communities don't have to wait until then to start discussions about what they want their students to know and be able to do in science. One of the key participants in the national drive for science standards—the American Association for the Advancement of Science (AAAS)—has already laid out a detailed definition of what all students need to know in order to be "scientifically literate." This document, and several others, are likely to figure prominently in the forthcoming science standards. (For more information, see Documents for Setting Standards Today, on p. 85)

In Houston, four junior high schools have teamed up with the National Science Teachers Association to use NSTA's new cutting-edge science curriculum. Instead of the traditional "layer cake," one subject-a-year approach, this curriculum has students doing hands-on activities that cut across biology, physics, chemistry, and other sciences.

Many communities are using innovative approaches to provide children with more opportunities to learn science. In rural Pennsylvania, Juniata College sends a van loaded with lab equipment to high schools within a 25 mile radius. This "chemistry lab on wheels" allows students to conduct an array of experiments—determining the caffeine content of coffee with a high performance liquid chromatographer, for instance, and measuring pollutants in aerosol cans with a spectrophotometer.

Some communities are also tapping the expertise of local scientists. To keep instruction up to date in the fast changing world, a school district in Frederick County, Maryland, has local scientists "auditing" its science curriculum. In the Albuquerque area, students are learning how exciting science can be with the help of real scientists from nearby Sandia National Laboratory. About 200 "science

ambassadors" from Sandia spend one day per week in the 177 schools that participate in the program. Sandia's program is a response to Secretary of Energy James Watkin's directive to Energy Department research facilities nationwide to establish programs to improve science education. Sandia, along with other national labs, also offers research internships and workshops for teachers.

The Boston Museum of Science doesn't keep science knowledge bottled up within its walls. It spreads it to the city's schools with "science kits," boxes filled with objects, activities, and readings on a specific scientific concept.

Most states and communities seeking radical improvements in science performance realize that teacher training is a priority. In Chicago, for example, science teachers are learning the latest techniques of their profession by team teaching alongside experts in the field. The Academy of Mathematics and Science Teachers aims to reach all of Chicago's nearly 17,000 teachers in an effort to move away from the traditional textbook-based teaching approach and to focus on experimentation, hands-on work, and problem solving.

HISTORY

History helps us understand and appreciate who we are, and what it means to be a person and an American. Students who don't know about people, places, events, and ideas that changed the course of history cannot understand or appreciate the values that have shaped our civilization.

Yet today, we know that:

- Only a quarter of eighth graders know that Lincoln's goal in the Civil War was to preserve the Union. 87 percent of 8th graders and half of 12th graders do not know that soldiers fighting for the South were called Confederates.

- More than half thought Jim Crow laws were enacted to *improve* the condition of blacks.

- A quarter of the nation's *college seniors* cannot place Columbus' voyage in the correct half century.

One reason our students don't know much history is that they spend little time learning it. Few states require more than one year of American history in high school, and half of all high school students study no world history at all.

Meanwhile, French students are expected to write essays on such subjects as "The Development of Soviet Domestic Policy from 1953 to Today," or "The Evolution of the American Presidency." Japanese students are expected to be able to identify and discuss criticisms of trade liberalization between England and France in the late eighteenth century.

Our students need to be challenged at world class levels. The National Center for History in the Schools at UCLA is leading a national effort to develop world class standards in U.S. and world history. Preliminary standards are expected in the fall of 1993.

Communities don't have to wait until 1993, however. Several documents being used to help develop the national history standards are now available—documents that include the highly acclaimed *California History-Social Science Framework*, *Lessons from History*, and others. (See Documents for Setting Standards Today, p. 86)

Other efforts underway to improve the teaching of history include El Sereno Junior High in East Los Angeles, where teachers are being trained to give students with very limited English proficiency a conceptual understanding of history. Last summer 40 history teachers in Ohio enrolled in an intensive four-week summer workshop on topics in American and world history.

In Los Angeles, the 75th Street Elementary School displays a 90-foot timeline of significant world, national, state, local and school events to help students see "news events" in perspective. The schools is among the first in the state to meet all requirements of the rigorous new California History-Social Science framework.

GEOGRAPHY

It is hard to understand what happens in the world, and why, without knowing where events are taking place. Geographic thinking is increasingly important in a world linked by telephone, fax, and jet travel.

However, in survey after survey our students reveal a shocking ignorance of geography:

- A third of our high school seniors do not know that the Mississippi flows into the Gulf of Mexico.
- Most do not know that if it is noon in New York, it is later in the day in Paris.

- A 1988 Gallup survey of geographic knowledge in nine nations revealed that ours was the only nation whose youngest participants, aged 18 to 24 years, scored *lower* than the oldest participating age group, 55 and over. Moreover, our youngest participants ranked behind their counterparts in the other eight nations, including Mexico.

Given the fact that geography has slipped off the curricular map in many American schools, these results are not surprising. In 1987, the most recent year for which data are available, only 15 percent of American high school graduates had completed a high school course in geography.

The National Geographic Society has been working to bring back geography instruction, and the National Council for Geographic Education is leading an effort to spell out what all students should know about geography. The standards for geography are expected by early 1993, but, as in other subject areas, many communities are proceeding on their own. Some are using *Guidelines for Geographic Education* to begin putting geography back into their schools. Many others are joining their state's Geographic Alliance Network, which provides training and support for teachers in nearly every state. (For more information, see Documents for Setting Standards Today, p. 88)

Communities are also using innovative approaches to help students learn geography. In Cambridge, Massachusetts, students at Shady Hill School learn to draw progressively more sophisticated maps from memory during the school year. By year's end, they are "Mapping the World by Heart," which is the name of this curriculum that hundreds of schools are now using. Other schools are encouraging students to participate in the National Geographic Society's National Geography Bee each year. This year, 5 million students participated nationwide.

Other Key Subjects

CIVICS

The day after the signing of the Constitution, Benjamin Franklin was asked what kind of government had been created, to which he cautiously responded, "A republic, if you can keep it." And for more than two centuries since, America has been the world's foremost model of republican self-government. Today, as totalitarian regimes collapse one after the other, and people the world over continue their struggles for greater freedom and dignity, the world is looking to America for guidance and inspiration more than at any other time in history.

However, our children's lack of knowledge about our own democratic institutions endangers our ability to fulfill that role:

- 58 percent of high school seniors believe it is illegal to form a third political party.
- 50 percent believe that the President can suspend the Constitution in times of national emergency.
- In 1943, 45 percent of college freshmen could name four of the specific freedoms guaranteed by the Bill of Rights. More than forty years later, a survey of adults found that 60 percent did not even know what the Bill of Rights is.

Nearly all 12th graders are eligible to vote the year they graduate. Will they be able to make reasoned decisions without a grounding in the purpose and function of government institutions?

One obstacle to citizenship education is that we haven't established what students should know. This state of affairs is about to change. This summer, a national effort was launched to develop voluntary World Class Standards for elementary and secondary education in government and civics. Led by the Center for Civic Education, this effort is expected to produce standards within two years.

Communities that want to get going can consult *CIVITAS: A Framework for Civic Education*. The Center for Civic Education is using this document to guide discussion about standards for civics education. In addition to equipping students with a working knowledge of the past, present, and future of American democracy, *CIVITAS* identifies the skills needed for civic activity, discusses the principles underlying representative government, and draws examples from history and current events. (For more information, see Documents for Setting Standards Today, p. 89)

The state of Arizona is using a mock election program to instill lifelong voting habits in children and to boost voter participation among adults. Three-quarters of the registered voters in Arizona said their children had initiated discussions at home about candidates and ballot initiatives thanks to the Kids Voting program. Students from K through 12 are taught the basics of voting and the electoral process. Then on election day, they accompany their parents to the polls and cast their own ballots in their own mock election.

ARTS

Recent years have seen a growing recognition of the importance of arts education. The National Endowment for the Arts reported several years ago that studying

the arts is useful in many ways, including helping students to understand civilization, to develop their own creativity, and to "learn the tools of communication."

Former New Jersey Governor Thomas Kean put it like this: "People who can communicate through the subtleties of the arts will have the skills and understanding that our 21st-century economy will require. The thespian will move from the stage to the board room with the self-confidence and range of intellect so vital to both. The engineer who has studied painting will grasp the "utility" of beauty in a world of increasingly sophisticated design...."

While most American schools provide some opportunities for voluntary participation in arts activities, such participation or study of the arts is seldom required. One result is that America's high school class of 1987, on average, earned only one and a half credits in the arts.

One obstacle to expanding arts education is that we haven't been clear about what all students should learn. This situation is about to change. A national effort is underway to develop world class standards in dance, theater, music, and visual arts. The Consortium of National Art Education Associations is coordinating this effort and expects to issue draft standards this fall. The Consortium's work is part of the *AMERICA 2000* Arts Partnership—a partnership that includes the National Endowment for the Arts, the U.S. Department of Education, the John F. Kennedy Center for the Performing Arts, and other groups. Plans are in the works for a National Center for Arts Education and a National Arts Education Dissemination Network.

In the interim, Beacon Day School in Oakland, California, invites 14 part-time specialists from the community to teach music, dance, drama, and visual arts. In Houston, the Wilhelm School provides a curriculum in which the arts are woven into instruction in both the sciences and the humanities. And in Dayton, Ohio, Shivers Middle School for the Arts arranges for students to receive private lessons in music and other arts from practicing artists in the community each week.

FOREIGN LANGUAGES

In striving to sharpen our competitive edge in the world, we would do well to remember a law of the marketplace: Business is generally conducted in the language of the customer. Businesses and business schools are putting more value on fluency in foreign languages. In addition, it is generally believed that learning a second language may confer other benefits, including improved thinking skills as well as first-hand access to the literary treasures of other lands.

While the number of high school students completing at least one foreign language course rose from 49 percent in 1982 to 65 percent in 1987, one year of studying a language is hardly enough. Moreover, the fact remains that a third of our students have spent no time in high school studying a second language.

The U.S. is virtually alone in the world in delaying foreign-language study until high school. Developing fluency takes years of work, and the key is starting early.

At Nishuane Elementary School in Montclair, New Jersey, all students begin learning either French or Spanish in kindergarten.

At the Great Falls Elementary School, in Great Falls, Virginia, about a quarter of the students spend half the day in a Japanese immersion program. They are taught math, science and health in Japanese.

PHYSICAL EDUCATION

Health and fitness are goals that complement learning and the development of a "sound mind," yet physical education can mean much more. Athletics can teach the reward of achievement that comes from struggle and hard work, which engender self-discipline, courage, self-confidence, and the willingness to take on challenges. Traditionally, that is why America has always valued physical education, and why many communities are making sure physical education has a proper role in the education of their students.

The National Association for Sport and Physical Education is a leader in setting standards in this area. The Association established benchmarks for excellence in physical education at each grade level and published them in a report titled *The Physically Educated Person*. (See Documents for Setting Standards Today, p. **91**)

Conclusion

The job of education—and the essence of both Goals 3 and 4—might be described as the cultivation of *educated citizens.*

Professor E. D. Hirsch of the University of Virginia has pointed out that being educated means more than knowing how to read and write. It is a matter of building up a body of knowledge common to the whole society; this includes names, places, events, and their relative meanings. Hirsch refers to this background knowledge as "cultural literacy."

Cultural literacy for instance, means knowing that a "violation of free speech" refers to the First Amendment to the U.S. Constitution, that the "speed of light" is an actual speed, and that the "law of gravity" wasn't passed by Congress.

Communicating in an educated way means having a stock of prior knowledge that one assumes other Americans have as well.

In a society where supreme power is vested in the people, being well educated is integral to becoming a good citizen and maintaining a republic. Many communities want schools to help students develop sound character—what New American School Design Team leader and former Secretary of Education William Bennett calls "moral literacy." In his book, *Our Children and Our Country*, he offers some examples connecting learning with good citizenship:

> Do we want our children to know what honesty means? Then we might teach them about Abe Lincoln walking three miles to return six cents and, conversely, about Aesop's shepherd boy who cried wolf.
>
> Do we want our children to know what courage means? Then we might teach them about Joan of Arc, Horatius at the bridge, Harriet Tubman and the Underground Railroad.
>
> Do we want them to know about kindness and compassion, and their opposites? Then they should read *A Christmas Carol* and *The Diary of Anne Frank* and, later on, *King Lear*.
>
> Do we want them to know about loyalty to country? Then we should want them to know of Nathan Hale, about the Battle of Britain, and the siege at Thermopylae...
>
> We want them to know that hard work pays off, so we should teach them about the Wright brothers at Kitty Hawk and Booker T. Washington's learning to read...
>
> We want our children to respect the rights of others, and so they should read the Declaration of Independence, the Bill of Rights, the Gettysburg Address, and Martin Luther King, Jr.'s "Letter from Birmingham City Jail."

The revolution in education has already begun, community by community. All across the country, communities are finding ways to help their students demonstrate competence in key subjects areas, learn to use their minds well, become responsible citizens, and prepare for the challenges of the next century.

The pages that follow offer more examples of innovative ways that communities are working to reach Goals 3 and 4, as well as sources for more information, suggestions for further reading, and a list of documents for setting standards today.

What Other Communities Are Doing

ENGLISH

Reading Recovery Program, Columbus, Ohio
The Reading Recovery Program provides at-risk 1st graders with daily individual attention and customized lessons prepared by their teacher. The program focuses on training teachers to evaluate their students' reading ability and make decisions to help individual students learn how to read.

"The program runs on the basic premise that every child can learn, especially if the teachers take responsibility for the child's learning," says Arlene Stuck, the supervisor for primary compensatory programs for Columbus Public Schools.

In the Reading Recovery Program, which has been implemented in 43 states, teachers work individually with each child in daily 30-minute sessions, building on what that child learned the day before. The teacher will often try a variety of learning methods, such as sounding out words or using pictures as clues, to find the most effective approach for each child.

Reading Recovery teachers are taught one-on-one teaching skills, innovative coaching techniques, and observation skills that the program considers essential.

Children in the program have developed stronger reading habits and are considerably less likely to be held back a grade. In Columbus, where 62 of the city's 89 elementary schools will implement the program this year, the number of children held back has decreased by over 50 percent in seven years.

"You're not just teaching the children how to read," says Reading Recovery Coordinator Mary Ellen Murray. "You're teaching them how to think."

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Elm School, Burr Ridge, Illinois
In 1990, Elm School posted the largest increase in writing scores in Illinois, due mostly to the school's effort to incorporate writing skills into every class from kindergarten to fifth grade.

"Writing is a child's natural response to what he or she has been taught," says second grade teacher Nancy Taylor. "It makes a child go through the information and sort it out and really understand what they've learned."

The written expression at Elm School begins in kindergarten when children recite stories to their teachers. By second grade, the children write their own books.

For example, second graders write a "book" in conjunction with their unit on manners. Children write on the bottom of a piece of paper the manners they think a second grader should have. Some students decorate the pages with drawings. When the unit is completed, the pages are laminated and bound into a book that is circulated to parents who critique the work.

In addition to the books, every child keeps a journal in math class and a personal log which is filled each day with sentences about the day and questions for the teacher. The logs are returned to the students in the morning with a written response from the teacher.

Teacher Bev Oliveri also uses writing in her fourth grade math courses. "When they have to write down and explain what a fraction is, their thinking becomes refined and the information is more than just memorized; it becomes part of their base of their knowledge," Oliveri says.

Oliveri also coordinates her curriculum with other teachers. For example, students writing Haiku poems about whales in English class learn about whales in Oliveri's science class.

Oliveri says that although the program has only been in place for two years, she can already see tangible results. "I see a high degree of confidence and willingness to try new things due to the writing," she says. "Having to share the writing with the rest of the class has also helped to involve some of the kids who would have just sunk into the background a few years ago."

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Boston Latin School, Boston, Massachusetts
Boston Latin School, the country's oldest public school, provides some of Boston's brightest students with a broad liberal arts education while also maintaining a strict core curriculum.

The students at Boston Latin (grades 7 through 12) have each undergone a competitive selection process that includes taking a secondary school admissions test and submitting report cards. The students are all Boston residents selected from over 200 feeder schools.

"We start their liberal arts education in seventh grade," says Philip Haberstroh, assistant headmaster. "The students get 10 periods of English each week, five of which are traditional spelling, vocabulary and grammar and the other five include reading and writing." A typical 7th grade English program would only offer five periods per week total, according to Haberstroh.

The school also requires students to take five years of Latin during their six years at the school. "The foundation of most Western languages is Latin, and this of course spills over into English," says Haberstroh.

The "spillover" is seen at Boston Latin in the success of the Advanced Placement English program. One hundred students take the test each year and 98 percent receive a respectable three or above out of a possible 5 points.

In addition to the Latin requirement, students must take four years of a foreign language, the first of which begins in eighth grade. Students may choose the more traditional offerings such as Spanish and French or they may pursue classical Greek or Mandarin Chinese.

Each student is asked to do at least three hours of homework a night, according to Haberstroh. "In order to be successful, you have to do that."

"We feel that training students in reading and writing is very important," Haberstroh says. "It's fundamental for everything else and one problem we're seeing today is that kids are just not able to put their thoughts down on paper."

In order to graduate from Boston Latin, students must demonstrate their analytical abilities on paper by completing a detailed research project. The students work on their projects in phases and they must present each phase to a teacher before moving on.

The average SAT score is 286 points higher than Boston students overall. Ninety-eight percent of the school's graduates attend college and 15 percent attend Ivy League universities.

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Folger Library Shakespeare Education Festival Project, Washington, D.C.

The Folger Library Shakespeare Education Festival Project works with teachers across the country to help children understand the plays of Shakespeare by performing them.

"The goal of our program is to provide methodology in how to teach Shakespeare, which lessens the intimidation of the material," says project director Cindy Pisciotta.

The program, funded by the U.S. Department of Education's National Diffusion Network, helps teachers understand how to make Shakespeare comprehensible to children in grades 4 to 12.

The training sessions may begin with the teachers learning diverse meanings that can be attached to the word "Oh" or listening to various popular music songs. These exercises demonstrate how a confusing, ambiguous piece of work can take on meaning through repetition and by noting context.

After studying some background on Shakespeare, teachers begin to learn techniques to help their students perform the material. "We teach them how to do choral readings so that the kids perform some material together," Pisciotta says. "There's strength in numbers."

The trainers advocate the abandonment of annotated versions of the plays, so the students must actively seek out any material they don't understand. This process helps children increase their vocabulary and reading comprehension.

"The kids have total comprehension," Pisciotta says. "They discuss and decide exactly what Shakespeare meant and they bring that particular understanding to the language."

The program usually costs about $1,000 to train a group of 25 teachers. In most areas, a few schools jointly sponsor the training sessions. The cost includes teaching manuals and a consultant fee.

"Teachers have raved about the success of what we're doing," Pisciotta says. "The kids are involved and committed and they've learned the kind of power and control they can have through language."

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MATHEMATICS

Family Math

For the mathematically frustrated, a team at the University of California, Berkeley, has created Family Math. This program aims to spark interest in math and reduce numerical anxiety by offering evening courses in math for both students and their parents.

"The goal is to make parents develop a sense of an ability or talent in math," explains Mentor Coordinator Grace Coates. "We want them to say 'I can do this.'"

The Family Math program begins when an interested teacher enrolls in the program. Family Math trains this teacher to teach math to parents together with their children. The teacher then invites his or her students to bring their parents to a series of ninety minute evening classes.

When the parents arrive, they may be confronted with an introductory lesson on Venn diagrams, followed by an extended discussion of the real-life applications of geometry. On Career Night, the teacher may invite an accountant or a real estate broker to speak on how mathematics is used in the workplace.

"The approach is what fascinated me the most. Being able to visualize a problem does indeed take the sting out of math," says one enthusiastic parent.

Family Math is supported by several public grants and is free for its participants. Additionally, teachers report that students who participate in Family Math are significantly more motivated than their peers.

Since its start, Family Math has spread from Berkeley, California, to 48 other states. The program has also been translated into Spanish and Swedish.

"Having time to work with my child on math in a positive atmosphere was the most valuable aspect of the course for me," concludes a satisfied parent.

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Master Teacher Jaime Escalante

In his 18 years at Garfield High in East Los Angeles, Jaime Escalante, helped an astounding 576 inner-city students to pass the College Board's rigorous Advanced Placement calculus test. Escalante, a Bolivian immigrant, taught his first calculus class in 1978; when he left Garfield High thirteen years later, the school had ten advanced placement calculus classes.

His success invigorated Garfield, whose seniors now rank among the best in all subjects in the huge Los Angeles school system. His work demonstrates that holding students to the highest standards is a sure way to raise their academic performance.

Escalante's classroom is full of energy and life. A banner tells students: "Calculus need not be made easy; it is easy already." Escalante cheers on his students when they give correct answers and throws a soft pillow at them when they don't. He sends a clear message to the students that says determination plus discipline plus hard work equals the way to success.

"Any student could learn mathematics if they have the *ganas*," states Escalante. Ganas is the Spanish word for desire. "That is the only thing we need from the students—the desire to learn."

In 1991, after 18 years at Garfield, Escalante moved to Hiram Johnson High, a 70 percent minority school in Sacramento. He has also begun a new public television series called "FUTURES," to boost interest in math and science. FUTURES is PBS's second best selling video series of all-time.

"One of the things I've noticed over the years, is that kids of the early age have a negative image about mathematics, especially algebra, because we do not emphasize the importance of this subject in elementary education," warns Escalante. His TV video series is intended to counter that image and show that mathematics is both fun and important for the road ahead.

At Hiram Johnson High, Escalante has students sign a contract that says they will go all the way from a basic math course to calculus AB or BC. Escalante also emphasizes that the school cannot educate the students alone. "The parents have to be involved 100 percent in order to accomplish the success we claim for our kids," Escalante says.

Escalante's success may not be common, but it is replicable. Teachers have to convey the same expectations of academic excellence to disadvantaged children, minorities and others that they do with traditionally successful students. Then, they must back up those expectations with whatever innovative teaching methods are necessary to unlock the students' determination and talents.

"Lots of teachers can do what I do," he says. "They just have to care more about teaching than they care about the system."

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Grace Church School, New York, New York
While children often need homework help from their parents, most parents have not studied mathematics for quite some time. Recognizing that fact, New York City's Grace Church School has created a special math class for parents.

Fifth Grade Math for Parents offers parents an evening version of the math class their fifth grade children are taking, teaching them a modern approach to elementary school mathematics.

The program's goals are to make parents feel more comfortable with the material their children are studying and to encourage parents to support the school's teaching methods which are slightly different than the traditional approaches to math.

"We teach alternative problem solving," said math instructor Herb Bender. Bender's philosophy is that there are numerous ways to arrive at the solution of a math problem and students should learn those ways and be able to decide which is most efficient for the situation at hand.

"My basic ideology is as old as the hills." Bender said. "You define the problem, see the alternatives and choose the best one. It's as simple as that."

The program has been a hit with parents. "They are constantly telling me that they've learned more about math from me than when they were in school," Bender said.

Bender insists that parents use correct mathematics vocabulary. "Using correct terms will help parents eliminate math phobia and the negativity they associate with mathematics," he says. "Whole numbers are not referred to as 'thingies' or 'normal numbers,' but properly, as integers."

The program's emphasis on alternative problem solving helps create a positive math dialogue at home and in the classroom. "No idea that comes forward is a bad idea; it's contributory to someone else's ideas," Bender said. "It's really just a very positive learning experience."

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Mission High School, San Francisco, California
"It's the best math course I've taught," says teacher Dean Ballard at the end of his first year. He was referring to Mission High School's innovative, three year mathematics curriculum based in part on the new standards established by the National Council of Teachers of Mathematics.

At Mission High, teachers become "managers of discoverers," as they guide students through the process of figuring out the relationship between mathematical formulas and "real-life" situations. Students must also communicate their findings in "real-life" language—the answer is not enough. It must be accompanied by a clear and full explanation.

Each year covered by the curriculum is divided into four to five units built around large problems. The "Pit and the Pendulum" unit begins with Edgar Allen Poe's story of a prisoner, lying trapped in a cell , as a 30-foot pendulum swings back and forth, dropping ever closer to the man's neck. In the time it takes for the pendulum to swing 12 times, he must devise and execute an escape plan. Will he escape in time? Was the story realistic?

The pendulum dilemma leads to a discussion of the influence of weight and length on the swing of a pendulum. The study of pendulums leads to investigations of linear and algebraic functions, standard deviation and probability.

Students begin to solve the pendulum problem by solving smaller, but related problems. Finding out when a circus bicycle rider must apply her brakes in order to come up close to a brick wall without crashing into it involves variables of time, rate and distance, all of which are connected to the swing of a pendulum. The two month unit culminates in the construction of a 30-foot pendulum, as described in the story.

Asking students to solve realistic, complex problems pulls math off of the blackboard and allows students ownership of each discovery. It gives them concrete references for abstract concepts. One student writes that "standard deviation showed me how scientists and I can eliminate certain data that may not affect an experiment."

Students work primarily in groups. Teamwork pools brainpower and teaches responsibility to self and to others. "At the beginning of this project I don't think I put very much effort into the experiments. After seeing that my group was falling behind I tried to reorganize and get our group back on track. We eventually got almost all of our data completed," writes one student.

Piloted three years ago, the new math program was first used in three schools. This fall it will be taught in 30 schools across the country.

Transition to an innovative curriculum and a new style of classroom management has been challenging for teachers and students alike. Despite the risks of change, Ballard finds the new curriculum more enjoyable to teach. And all of the students enrolled in the Mission High program have elected to take a fourth year of math.

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Academy for Mathematics and Science Teachers, Chicago, Illinois

Thanks to the leadership of Nobel Laureate and University of Chicago physicist Leon Lederman, Chicago math and science teachers will have a more profound grasp of the subjects they teach. In the fall of 1991, the Academy for Mathematics and Science Teachers (AMST) founded by Prof. Lederman, began retraining every one of Chicago's 17,000 math and science teachers. The Academy hopes to create more knowledgeable, more effective teachers who are better able to motivate their students.

"We want to help teachers approach teaching with a much greater knowledge than before," explains Director of Operations Mary Anne Edwards.

The Academy trains teachers to focus on experimentation and problem solving, a "hands-on" approach which emphasizes the processes of scientific thought rather than the content of the material. This emphasis on thought makes children far more comfortable with learning science.

"For the intensive program, we select schools on the basis of their commitment to send all of their math and science teachers to the Academy," says Edwards.

In AMST's Intensive Program, teachers devote 24 days spread over four months to learning new teaching methods and subject material. While the teachers hone their skills, specially trained AMST instructors substitute in their classrooms.

Afterward, teachers receive a semester of follow-up to ensure that the new techniques are implemented correctly.

On a wider scope, the Academy's Special Focus Workshops train teachers from public, private and parochial schools. They offer one-day to two-week workshops that introduce Chicago teachers to ground-breaking curricula and methods that highlight hands-on programs.

A Teacher Resource Center, scheduled to open this year, will include a library, classrooms, and laboratory work centers, and sponsor conferences, seminars and outreach programs. Teachers needing up-to-date information will be able to order whatever information and curriculum material they require.

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SCIENCE

Scope, Sequence, and Coordination Project, Houston, Texas

The Scope, Sequence and Coordination (SSC) Curriculum for secondary school science is a product of the Southwest Center for School Science Reform. SSC aims to increase the competency of science students and teachers by helping teachers update their scientific knowledge and teaching methods. Originally piloted in three Houston schools, the entire Houston Unified School District has recently adopted the SSC model.

The SSC model divides the science curriculum into thematic units, such as an Environment Unit, that use concrete activities and experiences to help students understand scientific phenomena and formulas. Instead of teaching them in isolation, each unit integrates the four scientific disciplines: biology, chemistry, physics, and earth/space science. Students learn about the interdependence of the sciences using real-life examples.

"Even in schools that offer science courses, the sequential nature of courses in different science subjects deprives students of the opportunity for integrated learning," says Project Director Linda Crow. Students need to know that subjects are interrelated with others and can be taught together.

Every student in the SSC program studies science for about seven hours per week in every grade from 7th to 12th. Again, integration of scientific disciplines is a key.

In order to learn the SSC method, teachers from over 35 participating campuses attend "summer school" taught by national and international experts. The goal is to reinforce teachers' factual knowledge while training them in laboratory-based, cooperative learning techniques for teaching scientific facts.

The program lets students discover science through their own experiences. Students routinely use laboratory equipment, interpret science in real-life applications, and explore how science affects society in general. An appreciation of the role of science in everyday life may encourage more students to extend their science education beyond the required minimum. The organization feels science is too important to be limited to the students who are gifted and talented or only those who are college-bound.

Students appreciate hands-on activities and the opportunity to become active learners and contributers. SSC classes have sparked the interest of all students. Crow relates, "A teacher reported that a 'repeater' who had failed science last year and had terrible attendance was doing remarkably better. She reported that the students said the repeater was coming to school just to participate in the SSC science classes."

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Science for Science Teachers, Berkeley, California
Award-winning professors and Nobel Prize winners gather each summer at the University of California at Berkeley to help junior high teachers increase their basic scientific knowledge and laboratory skills. Participants in the Science for Science Teachers program have gone on to receive numerous teaching awards, to design similar programs for their home states, and to institute positive changes in their classrooms, schools and districts.

"We aim to inspire teachers to be life-long learners and to provide them with the tools to succeed," says Penny Moore, the program's director. "Our hope is to change the crisis in science education into a revolution in science education."

The program receives over 1,000 applicants for 50 spots. The selected teachers hear lectures in inter-disciplinary approaches and basic principles that undergird the core sciences. These lectures form the basis for laboratory activities held in the afternoon. Some workshops feature techniques to incorporate computers into the classroom. Teachers also visit major laboratory sites to use seismographs, telescopes and other instruments.

The program also tries to prepare the teacher to encourage students to be inquisitive, to exercise judgment and discretion, to be comfortable with the uncertainty of the scientific process, and to want to learn more.

"The teacher who can do this for his or her students will have accomplished much more than can be measured by any test yet written," Moore says. "The most striking growth stemming from our program is in the increased confidence and professionalism of the teachers."

"Scientists and engineers will play an increasingly important role in the nation's work force in the technologically competitive world market that is now emerging," Moore says. "If the United States is to continue to improve its standard of living, there must be a quantitatively and qualitatively adequate flow of new entrants into the scientific fields."

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Thomas Jefferson High School, Alexandria, Virginia
Thomas Jefferson High School for Science and Technology was established in 1985, largely thanks to a innovative partnership between businesses and schools.

Since the school opened, businesses have contributed a total of $5.5 million—one quarter in cash and the rest in equipment and materials. Jefferson now has state-of-the-art facilities and innovative programs on a level matched by few high schools.

"We were founded with the notion that business and industry would be needed to finance the science and technology that we wanted for Thomas Jefferson," explains Principal Geoffrey Jones.

"At Thomas Jefferson, we don't talk about technology as equipment like a computer or a VCR, but as a thought process. Its the use of this equipment that is the technology," says Jones.

The core of Jefferson's curriculum is a comprehensive college preparatory program, with heavy emphasis on science and math. A student may take a course on artificial intelligence and DNA biotechnology along with interdisciplinary courses that combine biology, English, and engineering. Half of the required credits for graduation are in mathematics and science.

"Teachers at Thomas Jefferson are encouraged not to think of subjects as single entities but rather how they are intertwined," explains Cathy Crocker, Assistant Principal at Thomas Jefferson High. Jones adds, "Students are taught to look at the world around them and see how everything is interdependent."

Students are selected to attend Thomas Jefferson through a very competitive process that evaluates every aspect of the candidate. Applications are reviewed by independent selection committees that eventually narrow each class down to just over 400 students.

Students do not attend every course every day and flexible scheduling allows all classes to meet for a double period each week. Additionally, each senior at Jefferson completes at least one year-long research project.

The school is particularly rich in research facilities and laboratories, boasting eleven science & technology labs, all of them funded by private business and industry. The labs are designed to provide students with experience in state-of-the-art technology environments. A $1 million supercomputer, the only one in a high school anywhere in the country, sits proudly in the computer systems lab,

the result of a first-prize award in a national student competition in computer programming.

Jefferson also offers annual training workshops to 300 to 400 teachers from the Washington, D.C. area schools. Jefferson students tutor local elementary and junior-high students and a summer program allows students from other schools take advantage of Jefferson's special resources.

Above all, Jefferson prides itself on being a laboratory to test new schooling ideas. Jones points out that the first class of the day lasts three hours with a schedule determined by whatever interests the students. Jones explains, "Thomas Jefferson encourages the blending of science, application, and humanities...teachers are willing to give up the specialty of each subject."

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HISTORY

Ancient Civilizations, San Diego, California

As San Diego school children while away the summer, their 6th grade teachers are going to school. Some fifteen San Diego teachers are participating in the Ancient Civilizations project, a program that focuses on history and geography, and on the use of primary materials to study ancient civilizations.

In the summer of 1991, San Diego city schools and San Diego State University jointly launched the Ancient Civilizations project with a course on Greek antiquity. The program began in response to California's new History-Social Science Framework. The course, which lasts two-weeks, helps teachers upgrade their knowledge so they can teach the more demanding state curriculum.

"It gave me lots of information that I wouldn't have had time to dig up otherwise," says Lilia Barr, a teacher who last year took the Greek course. "The professors were also very responsive to the interests of the teachers. When we

really wanted to know basic stuff about the daily life of these people, they added the information to the course."

In the summer of 1992, the program included lectures, discussions, and slide presentations on the history, literature, philosophy, art, and architecture of ancient China. It was taught by various professors at San Diego State University. Teachers also visited local archeological museums to get a more tangible

Comments of past participants indicate that the sixth grade teachers gained both concrete knowledge and a deeper appreciation of the civilizations they studied. Additionally, they learned a great deal about historical scholarship and were able to teach their students the skills historians use.

"In class, if you talk about something you really know about, the children listen. They are motivated," says participant Sue Sachs. "I think it really made a difference in how I teach."

The Ancient Civilizations program is funded by a grant from the National Endowment for the Humanities. The small scale of this program—and the fact that it is the product of a collaboration between a school district and a local university—suggest that the model could be easily replicated elsewhere.

"I was able to provide a richer tapestry for the children," explains Barr. "By the time school began, Greece was a part of me."

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GEOGRAPHY

WorldWise Schools - Peace Corps

For three decades the Peace Corps has enabled young Americans to understand geography by sending them overseas to learn about exotic cultures. Now, with its World Wise Schools (WWS) program, those volunteers get to share their experiences with kids back home.

"The kind of information that is exchanged cannot be explained in textbooks," says Information Program Manager Brian Lonardo.

WWS is a response to the growing realization that many young people are extremely ignorant in geography. The program's three aims are to promote the study of geography, to stimulate interest in the world's many cultures, and to demonstrate the value of volunteer service and citizenship in a free society.

Under the WWS program, volunteers are matched with a teacher. They exchange letters with the class. Often they send pictures and artifacts, while the students send care packages and letters.

During the 1991-92 academic year, over 3,000 teachers were matched with volunteers serving in 70 countries. The Peace Corps is working on setting up partnerships with local chambers of commerce, district school boards and civic organizations to help promote the program and install it across the country. So far 14 states are actively on board with the program.

WWS also offers videotapes, free of charge, to interested teachers. The guidebook that accompanies the tape explains more about the places and issues involved and about the Peace Corps.

The Peace Corps bears most of the costs of WWS. Schools also receive teacher's guides, newsletters, and volunteer speakers free of charge. Returning volunteers who visit their corresponding classroom pay their own travel and expenses.

"In a way, we're a victim of our own success," says Mr. Lonardo. "We're having so much trouble keeping up with demand that we may have to turn away a few requests this year."

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Mapping the World By Heart, Cambridge, Massachusetts
Cambridge, Massachusetts, educator David Smith's innovative curriculum makes a world of difference in the way students learn geography. Smith's program exposes seventh-graders to an eight month classroom exploration of the world that culminates with each student creating from memory a detailed map that includes the names and borders of approximately 150 countries with their mountain ranges, rivers, and cities.

"The thing that's most impressive to me," Smith says, "is that in September when I show kids a map from the previous year, they say there's absolutely no way they can ever do anything like that, but then in May, they actually do it."

The curriculum is divided into about 9 geographical areas that each merit 2-3 weeks of study. The first week of the semester is spent learning about maps in general and introducing the students to a new type of map scale created specifically for Smith's curriculum by Arthur Robinson at the University of Wisconsin.

During the first week of each unit, teachers give students blank maps of a specific area of the globe and the students use an atlas to label the map with a list of cities and geographic features Smith has provided.

The second and third weeks of each unit are dedicated to review games such as "Geography Baseball," where students are divided into teams to field questions that the class has submitted. The questions are weighted so that a difficult question like naming the capital of Burkina Faso (Ouagadougou) may be a home run.

The students also play "Around the World" in which students ask each other questions about places. Each student has a card that represents the answer to

one of the other cards and a new question. The first question may say, "I have Lima, who has my country?" One student will answer, "I have Peru, who has the country to my east?"

"Geography is the underpinning for everything else," Smith says. "Without knowledge of location and place, what good is a novel about Europe or a class about the Byzantine Empire if you can't visualize it?"

The demand for information from educators on his curriculum has grown so immense that he has taken a leave from teaching at Shady Hill School in Cambridge to engage in geographic consulting. His program has been adapted to teach world geography to students from grades 4 through 11.

However, learning knowledge of the world is just one of the benefits of Smith's curriculum. "In an age where everybody is concerned with quick gratification, to start something in September and finish it in May, and do it beautifully, is an important lesson on how you learn," Smith says.

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Governor's Academy for Geography, Greeley, Colorado

This past summer, a group of geography educators and specialists from eight states met in Colorado as a part of a Governor's Academy for Geography. Many of the Academy's attendees are also members of a Geographic Alliance in their home states, sponsored in part by the National Geographic Society. Academy members will influence geography education at the state level by guiding curriculum changes and at the grassroots level by suggesting content and methods of geography education.

While 1992 was the first year the Academy has met, state Alliance groups began to form in 1987. Alliance groups now exist in 49 states. They involve teachers of all grade levels and subjects, and they aim to help all teachers learn how to incorporate geography into their curriculum.

"Alliances are a grassroots kind of movement," says Charles Gildersleeve, Professor of Geography at University of Nebraska. "That's where you really get dedicated people."

Teachers attend Alliance institutes for several weeks in the summer. They each bring a lesson plan in any subject, and are taught how to incorporate geography into their unit. They update their content knowledge, and practice teaching methods, which are then critiqued by other teachers.

All of the institute participants give workshops in geography education to other teachers in their school and districts. Professor Gildersleeve reports that over 1,000 Nebraska teachers have either participated in an institute or attended a workshop conducted by a teacher who was trained at an Alliance institute.

The institutes provide teachers with expertise and encouragement. "They offer training so teachers are empowered to teach other teachers how to offer more and better geography," states Gildersleeve.

While Alliance institutes encourage grassroots expansion of geography instruction, the Academy will publish recommendations for the style and content of geography education for statewide curricula. Geography specialists at the Academy examined four specific areas: academic content, assessment, training models for teachers, and general changes in geographic education.

In each area, the emphasis is on change. Educators hope to change the amount of geography that is taught in schools as well as the way it is taught. Geographic information is relevant to all subjects, including history, economics, and even English. "A lot of literature in a roundabout way teaches place and location," says Jim Shepard, a curriculum specialist in Nebraska.

Both the Academy and the Alliance aim to encourage teachers to put geography back onto the curriculum map, and inspire and enable them to help other teachers do the same.

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CIVICS

Kids Voting, Arizona

In Arizona, children accompany their parents to the ballet box, casting their own, separately counted vote. Piloted statewide in Arizona in 1990, Kids Voting hopes to boost voter participation among adults and instill lifelong voting habits in school-age children by bringing the whole family to the polls.

The idea for the program came from Costa Rica, where voter turnout, at 80-90 percent, is the highest of any democratic nation. A Costa Rican cab driver tipped three Arizona businessmen on the secret to Costa Rica's extraordinary record.

"One of the keys," he told the trio, "is that children accompany their parents to the polls from an early age and cast their own special ballots at the polling place."

Upon their return, the businessmen helped form what is now the Kids Voting program. In each school, children from Kindergarten through 12th grade receive between 6 to 12 hours of instruction about what it means to vote, why it is important, and how to do it. During the instruction, current issues are woven into the curriculum to encourage kids to think about and discuss issues in class and at home.

"Creativity in the classroom was phenomenal," says Marilyn Evans, President of Kids Voting. "There were student debates, plays, candidates at schools, ballot box decorating, and great discussions about Arizona's needs and outlooks related to the 1990 election."

On election day, the children cast their ballots on the same issues and candidate races as their parents. This takes place in a booth adjacent to the voting booth their parents use, in their regular neighborhood voting site.

"To me, the best statistic is that 77 percent of parents who are registered voters said their children initiated discussion at home about the 1990 candidates and the propositions," says Evans. 92 percent of Arizona's registered voters approve of the program, with 7 percent saying the reason they voted was because of Kids Voting.

This year, the program will assist 15 pilot projects nationwide, which will expand to statewide projects in 1994. Evans hopes additional projects in different states will add to voter interest.

"My children will not quit discussing politics at home," says one parent. "They expect me to state succinctly my reasons—pro or con—for support of propositions, candidates, and my chosen party affiliation. I am surprised and delighted with their interest and insights, but I will be eager to return to previously discussed simple topics such as movies, fast food, and sports!"

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ARTS

PROPEL, Pittsburgh, Pennsylvania

The PROPEL program is an approach to teaching and assessment in the arts and humanities created as a collaborative project by Harvard University's Project Zero, the Educational Testing Service (ETS), and the Pittsburgh public school system. PROPEL's curriculum encourages students to reflect on their own work and critique it along with their teachers. This helps students assess their own intellectual accomplishments.

Although the PROPEL curriculum can be applied to any field, the Pittsburgh public school system has implemented the curriculum chiefly in its arts, music, and composition courses. Over 21,000 students grades 6-12 are exposed to the program.

The curriculum is structured around three main activities: 1) artistic production, 2) artistic perception, and 3) artistic reflection.

"Traditional courses focus almost exclusively on the production aspect," says Howard Gardner of Harvard's Project Zero. "We want to give students a feeling of what its actually like to solve problems in an art form and at the same time pin down their own thinking about how the project works."

The PROPEL curriculum advocates a "process folio" that students and teachers can use to assess learning. The "process folio" contains initial plans, drafts, early self-evaluations, feedback by peers; and plans for subsequent projects.

The "process folio" requires student reflection. In the typical classroom, students are neither accustomed to analyzing the development of a product nor are they asked to judge the process. Students frequently may be asked to pick out a most and least favorite work and analyze why they like or dislike the piece. Over time, students learn about themselves as writers or artists so that their perceptions of their best work may change.

The PROPEL curriculum also includes "domain projects," which are sets of exercises that involve production, perception, and reflection. Domain projects are sustained pieces of work taking place over many class sessions, focused on issues and questions that remain central to a particular subject. These projects are intended to encourage students to assume different roles and responsibilities of maker, critic and judge.

Domain projects include, for example, graphic composition in the visual arts and character development in imaginative writing. The projects feature several assessment components used by students, teachers, or other assigned assessors.

One middle school instructor has said that PROPEL is the most exciting thing that has happened to her teaching. For the first time, she confesses, students are held accountable for what they have learned; they are internalizing and personalizing their writing. PROPEL has made a profound difference by linking assessment with curriculum, requiring students to contribute to the selection process.

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St. Augustine School, Bronx, New York

In one of the nation's poorest districts, St. Augustine School is a ray of hope for hundreds of students who may see little opportunity elsewhere. In 1985, St. Augustine began actively using the arts to facilitate success in the more traditional academic subjects. It continues this tradition today, with great effect, despite serious funding cuts by the Catholic Church.

"What we're trying to do here, very simply, is help kids discover themselves through music. There's got to be harmony inside you before who can resonate with the world," explains Principal Thomas J. Pilecki.

St. Augustine is actually two separate schools under the same roof. St. Augustine School is a traditional parochial school for grades K to 8, funded jointly by tuition and the Catholic Church. Its companion, Augustine Fine Arts, is a school of the arts that emphasizes music. Augustine Fine Arts is entirely funded by the private sector.

St. Augustine emphasizes the arts because they motivate students to learn the academics. "Art boosts interest in school. If a student really enjoys playing the trumpet, then the boring math class that follows the trumpet lesson becomes much more bearable," says Assistant Principal Chris Pates.

"In having to learn the arts...you have to learn to be creative and to think. You also learn that hard work and persistence pays off. Then, when a tough math problem comes around, you can say, 'I succeeded in the trumpet. Now I'm going to succeed in math.'"

The schools integrate their curriculums, giving each student several hours of music and art lessons every day on top of their regular school work. Furthermore, the arts faculty and the academic faculty try to coordinate themes in order to spur interest. For instance, while the drama students gear up for a Shakespeare performance, the English classes read Shakespeare plays.

On the Catholic side, the school combines tough academic standards with strong moral values. Every student begins studying a second language in second grade and St. Augustine requires computer classes for all students in grades 4 through 8. Additionally, St. Augustine stresses self discipline and hard work, with religion classes every other day.

St. Augustine has met with significant results in achievement to match its already important accomplishments. Ninety-five percent of St. Augustine students read at or above their grade level. According to Pates, "Whether it's music, dance, or

drama, each requires a collaborative effort by many that results in a positive experience for all."

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TECHNOLOGY

Interactive TV, Kentucky

In rural Kentucky, it was once impossible for many students to take Advanced Placement courses. Now, Interactive Television offers rural students across the state Advanced Placement and a variety of other courses by bringing qualified teachers to isolated classrooms via satellite.

"God did not place in mountainous, rural towns, qualified teachers that can teach Advanced Placement courses in an acceptable student to teacher ratio," says Ms. Virginia Fox, CEO of Kentucky Educational Television (KET). Now, state-of-the-art communications technology is, in the words of Ms. Fox, "bringing the Mountain to Mohammed."

Interactive Television programs (ITV) allow any school nationwide to purchase from KET a computer, twelve "interactive keypads", a printer, a TV with a VCR, and a cellular phone. With this setup, they can access a wide range of Advanced Placement courses ("Star Channels") that are beamed to the TV sets via satellite. The cost is $6,000 for the equipment (one-time cost) and then about $700 per student per course. Students in Kentucky favor German, while out-of-state students opt for Japanese.

The "interactive keypads" allow students to respond individually to questions asked by a KET teacher hundreds of miles away in Lexington, Kentucky. The results are tallied instantly, letting the teacher know right away whether the question was too easy or too difficult. With the printer, satellite teachers can even drop a pop quiz on the unwitting pupils.

The cellular phones are particularly popular, because they allow students to respond orally to questions posed by the distant teacher. A teacher may ask Alabama students their opinions on a certain issue. The Alabama students will then call in and offer an answer. The phones also enable the students to form study groups with their peers in other states.

"Geography is no longer a barrier," says Fox. "With ITV, rural Kentucky students interact with their peers in 22 different states, including several large metropolitan areas. They are finding that they can compete with hundreds of other students across America."

More than 50 percent of last year's ITVs Advanced Placement calculus class received the highest score possible on the exam. Teachers and parents rave about ITV as a learning tool.

"I hesitate to say it, but I think I have more success in this area with my television students than I did with my face-to-face students," admits Chuck Duncan, a physics teacher for KET.

"The confidence level of many rural students isn't terribly high," says Ms. Fox, "They are bright kids and they don't know it. When they have the opportunity to compete on a level playing field with other students in other states, they find that they *are* smart. These rural kids who are so often looked down upon can finally say to themselves 'I can be a world class student.'"

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Voice Mail at Canton Middle School, Baltimore, Maryland

At Canton Middle School, habitually tardy students get a call at 6:30 AM to get them out of bed. Canton, which serves 640 children in a low-income neighborhood, uses a personal computer to phone parents and students about everything from missed assignments to P.T.A. meetings. Parents can also call in to get their child's homework assignments.

"There's absolutely no reason for a student to come to school without their homework completed," says Assistant Principal Louis Williams. "The system reduces that kind of thing."

An automatic dialer hooked up to an answering machine calls selected homes and leaves a recorded message. Most commonly, the machine informs parents that their child missed school. Canton also sends customized messages, either to a select group of homes or every parent in school.

Electronic voice mailboxes hold information such as homework assignments and student accomplishments. Parents who call the school can selectively listen in on whatever information they need. Canton even includes suggestions for home learning activities that accompany the nightly assignments.

Since the program began two years ago, absenteeism has declined by one-quarter. Starting this fall, eleven more Baltimore schools will add a voice mail system. In the future, Williams hopes the system will significantly increase both parent involvement and parent-child communication.

"It's excellent. It's wonderful," exclaims Williams. "It's exactly what parents need to make sure that their children are doing their homework."

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BREAK-THE-MOLD SCHOOLS

Harrison, Arkansas

A wonderful and intriguing phenomenon is taking place in the schools of Harrison, Arkansas, a town of less than 10,000 people in the middle of the Ozark mountains. While Harrison's per-pupil spending is in the *bottom* ten percent of the nation, Harrison's students test in the top *ten* percent of the nation, due largely to the commitment of Harrison residents to their community and their children.

"You get better results if you *expect* better results—in science or math or reading or football or band," according to Harrison School Superintendent Charles Adair. Beyond high expectations, Harrison's success is a product of frugality coupled with lots of community support.

Harrison is an example of the kind of close working relationship between the schools and the community that AMERICA 2000 is all about. Parents are integrally involved in school activities, teachers have been empowered to make significant decisions, and community civic and business involvement is a given.

"Whatever the need is, people seem to rally around and volunteer," remarks Adair. Many people in Harrison, including Adair, remain in Harrison after they graduate, or return to raise their families. They work hard to maintain a caring and cooperative community.

Almost 100 parents sign up each week to do an hour of volunteer work in the town's five elementary schools. The work includes grading papers, reading aloud, photocopying—all to save teachers' time. When high school teacher Tom Street decided the school should have 10 more computers, he spoke to local civic clubs, and in only a few months he raised the $10,000 he needed. Two book fairs raised $1,200 for new library books. Local businesses give discounts to honor students.

"Our community values education, and we try to impress upon parents that they are welcome in our school," Adair says, "For instance, I meet with the parents once a month to discuss different problems or questions that they have, and I think that's been a way to facilitate communication between parents and the administration." Parents and teachers also meet each year in school councils to determine goals for the next year. Each school then reports its goals with an ad in the Harrison Times.

One goal is getting kids into top colleges. Teachers and parents encourage students to start taking standardized tests early—and often—to familiarize themselves with the format and improve scores.

The district also prides itself on the effectiveness of its financial management. Smart spending includes renovating and up-keeping a 1915 school administration building, instead of building a new one, buying five used school buses at one-third the cost of two new ones and making students write on both sides of the paper.

Teachers at Harrison's schools are paid $23,461, which is a few hundred dollars above the Arkansas average salary. "Although it's important to them", says

Adair, "they seem to be more interested in producing than worrying about their pay."

Teachers are given a big say in how things are done, and the administration and the community treat them with respect. Harrison proves that human values—such as expectations and firm community support—count more than dollars.

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Daniel Webster Elementary School, San Francisco, California

Daniel Webster Elementary School, an inner-city school in San Francisco, California, shatters long-held assumptions about what low-performing students need in order to be brought up to speed academically. Using Stanford University's Accelerated Learning program, Webster *speeds up* instruction instead of slowing it down and endlessly repeating the same material.

Rather than focusing on drill and repetition, Webster works to develop students' abilities to think, reason, and solve problems relevant to their everyday lives. The program also aggressively promotes parental involvement.

Rather than concentrating on traditional academic approaches, Webster gears its curriculum around students' experiences in daily life and the local community. The approach is visual, auditory, and participatory. "A lot of our students are relational learners," explains principal Willie Santamaria. "They learn from each other. We encourage teamwork."

The school respects student needs, and prides itself on the fact that it doesn't chain students to paper and pencils; rather it promotes self-expression and emphasizes values, knowledge and concepts.

The Accelerated Learning model, developed by Henry Levin at Stanford University, emphasizes the development of higher order thinking skills by making learning fun and relevant to students' lives, instead of dull and repetitious.

One major factor in the school's success, according to Santamaria, is a new governing structure that incorporates significant parental involvement. The school has various issue-focused committees, composed of teachers, parents, paraprofessionals and in some cases a student representative. These report to a steering committee which makes final recommendations to the staff.

Parental involvement, according to Santamaria, has become the strongest part of the structure. "I started a cooking class with the parents which became very big. I taught them learning styles through writing recipes and when they served the children in the cafeteria, the parents taught them table manners. Now we have parents coming in everyday for the cafeteria, for the yard, for the resource room, and for teachers. They also now wake up their kids in the morning so they come to school on time, and they call in for absences. It's a fantastic thing."

In fact, parental involvement has caught on so well that an average of 23 parents come to Webster every school day to do volunteer work. Parents help their children learn while obtaining marketable skills themselves. Santamaria has recommended many parent volunteers to local employers.

After four years in the Accelerated Schools program, in 1991 Webster showed large gains on state math and language exams. Other improvements in the school have been a very low teacher turnover rate and high student attendance rates.

Webster's success demonstrates that high standards can have extraordinary results with low achievers, especially when bolstered by parental support.

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West Ridge Elementary School, Greece, New York

If you think a class of 25 fourth graders is chaotic, try putting them together with 25 third and fifth graders. Welcome to the West Ridge Elementary School, where every child joins a "family" of 75 students and three teachers. West Ridge aims to increase communication between students, parents, and teachers by grouping

children in three-year families, while simultaneously boosting their learning by integrating technology into every classroom.

The "family groups" include children from three grades, either K to 2 and 3 to 5. West Ridge has three K to 2 primary families and three 3-5 intermediate families, for a total of 460 students. By putting the children in these more permanent clusters, West Ridge encourages the children to learn from each other. Older students are urged to help and support the younger students.

"The purpose of the family groups is not to categorize or separate, but to meet the needs of everyone side by side," explains Johnson. "The teachers have a much greater opportunity to get to know the children."

The family groups strive to accommodate each child's individual learning style. One kindergartner who arrived at school knowing how to read was given the opportunity to read to first graders.

"With the family system, the kids get to know the teachers better," says Johnson. "The parents also get to know the teachers better because they've had several years to do so. It breaks down some artificial barriers between school and home."

Teachers feel significantly less isolated under the family system. Not only do they work daily with other teachers, they learn from them too. If one teacher in a family knows how to use the new multimedia learning system, he can teach the other two teachers.

Computers play a central role at West Ridge. The school has a network of over 160 computers with seven computers in each classroom. A wide variety of software programs are available, including instructional programs, word processing, on-line multimedia encyclopedias, and desktop publishing. Students can access West Ridge's automated library from every classroom.

"We could never go back" to teaching without computers, says Johnson. Even kindergarten students use headphones and learn to punch keys on the computer before they can read or write. "The computers are used on a regular basis as a tool for understanding and getting in touch with the world," says Johnson.

Teachers at West Ridge often tie math, science, and other subjects together. The math classes use learning centers, computers, and cooperative learning groups to develop superior understanding of the subject matter. West Ridge even uses an interactive video series to help develop problem solving skills.

West Ridge Elementary is managed by a shared decision making strategy that includes both teachers and staff. Parents, who are heavily involved in school decision-making, sit on committees governing every aspect of the school. They even attend the faculty meetings, which are open to all parents.

"Parental involvement has become absolutely necessary for making decisions," says Johnson. "Their interpretation helps us see things differently." Joan Marcello, a teacher at West Ridge agrees, adding that she "always knows there is a place to go with any problem."

The school district requires that West Ridge's operating budget equal that of the other elementary schools in the district. Partnerships with IBM, NYNEX, Eastman Kodak, and Sears provided 80 percent of the $864,000 in technology start-up costs that launched West Ridge.

West Ridge is living proof that once new ideas and new technologies are given a chance, they become vital components that a school cannot live without. West Ridge is a school of choice, and therefore the commitment of the parents cannot be considered incidental. According to Ms. Marcello, "There is a real belief that we are a community. We are responsible for what goes on here."

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Granite School District, Salt Lake City, Utah

Thomas Jefferson Junior High went undefeated last year, beating seven other middle schools in Salt Lake City, including several from more affluent neighborhoods. The competition however was not football or track; instead, Thomas Jefferson beat seven opponents in a mathematics academic competition organized by former Secretary of Education Terrell Bell. By giving such academic contests regular schedules and standardized rules, Bell hopes to give academic achievers some of same recognition that athletes often receive.

"Why not motivate scholars the way we motivate athletes?" asks Bell. "They are our future leaders; they merit recognition just as much as our gifted athletes."

Bell began the project with a sponsorship by the regional Pepsi Cola distributor. After talking to the Superintendent of the Granite School District in Salt Lake City, he convinced eight middle schools to join the project.

"We thought the high schools might be too busy with their activities to try ours," explains Bell. "Besides, we feel that academic motivation is most valuable at the middle school level."

The competitions themselves have four rounds. The first two involve individual competition between students seated opposite each other on a stage. In the third round, students that have been working on a specific problem or issue for the first two rounds present their conclusions. In the last round, the entire team works together on a series of problems.

"Unfortunately, academics are not cool. Sports are cool," says Henry C. Roman of Pueblo. "We have to change the way kids think."

After a team has been formed, all that's required is a scoreboard and a trio of judges. Bell's organization furnishes these items, along with a sealed box of questions. Some schools also compensate a teacher for coaching their team.

After one season of operations, a survey done by Bell indicates that the program is very popular among all involved. The program will grow from the original eight schools to 14 this fall. Other schools nationwide are interested in Salt Lake City's success, with programs in Pasadena, Texas; Lake Washington, Washington; and Pueblo, Colorado scheduled to start soon.

One parent, Hazelann Griffiths, knows the competition's importance for her son Ken. "I have...a son on the basketball team. But all kids are not into sports. And this is Ken's place to shine."

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ASSESSMENT

Vermont Portfolio Assessment, Norwich, Vermont

In Vermont, fourth and eighth grade students compile folders throughout the school year that contain their work in math and writing. These "portfolios" are reviewed and assessed by trained Vermont teachers in state wide scoring sessions. Scores are used to chart the academic growth of individual students and to provide Vermont schools with feedback on the progress of their overall student populations. Portfolios allow students to demonstrate what they know and how well they can communicate their knowledge.

Often the reflective process—examining and editing one's own work—is allotted little classroom time. Peter Anderson thought his students would only take two or three days to choose the "best pieces" from their writing portfolios. It took them a week. It could have taken longer. "It was the most valuable week of the year," says Anderson.

In those "eight days gained" reviewing past work, Anderson says, "There was no question about motivation to appreciate and reflect on what they had done."

Students are given lists of the criteria used in evaluating their writing. "Does the writing show clarity of purpose, detail, voice and effective tone?" Students look for the same qualities the assessing teachers will, and they will include a cover letter explaining why they chose their "best piece."

Mathematical performance will also be judged by certain standards, including questions such as, "How did you solve the problem? What can you say about your solution?" In the math portfolio, the "road traveled" (process) is as important as the "destination" (solution).

"Self-examination helped the students understand how important writing is," states Anderson. Presenting their work to others allows them to share ideas and show off their accomplishments.

"Just as it is to an artist or investment banker," he relates, "a student portfolio is a sampling of wares." It is a mark of progress and achievement, a source of pride.

Unlike multiple choice tests, portfolios directly document a student's thought processes as they progress throughout the year. Anderson says, "I couldn't enjoy good teaching elements without portfolios because as a set of documents they

make me appreciate things that work with kids, and drive me to put their best stuff in them." Thus teachers and students appreciate the work that portfolios represent.

Contact:
Elizabeth Rand
Vermont Department of Education
120 State Street
Montpelier, Vermont 05620
(802) 828-3111

EXTENDED HOURS

Extended School Program, Murfreesboro, Tennessee

Several thousand elementary school children in Murfreesboro, Tennessee go to school at six every morning and stay until six that evening. They are part of Murfreesboro's Extended School Program, which offers day care before and after regular school hours.

"It is our goal to provide the best day care available anywhere in the nation," explains Ms. Becky Bookner, Director of Extended Schools and Community Education.

The Extended Schools Program (ESP) begins at six in the morning and ends when school starts. It resumes after the children finish their school day. Since the Murfreesboro City School Board authorized ESP to use school buildings and facilities, parents don't have to move their children from school to daycare.

"Before this program, some businesses saw three quarters of their employees leave at 3:00 p.m. to shuttle their kids somewhere after school. Now they get their work done and pick their kids up when they get off work," explains Bookner.

ESP does not limit itself to traditional day care. In addition to the standard sports and games, ESP employs certified teachers to teach foreign languages, typing, and music lessons. ESP also provides one adult for every twelve children, offering more individual attention than the children get in regular school.

"At first, the kids would be so excited during the school day that their teachers would get nervous," says Bookner. "They still can't wait for school to end so that they can run downstairs and start having fun again."

Bookner tells a story of a federal regulator who, while visiting, saw two children crying. When the official asked what was the matter, the parent explained that the children simply didn't want to leave.

Tuition provides 100 percent of ESP's $900,000 yearly budget. There is no state or federal funding, other than the use of already existing school facilities. A full day of care costs $26 per child and $13 for each additional brother or sister. Summer, vacation, and holiday care costs $40 for the whole day.

Financially disadvantaged parents can barter their own time for reduced rates. Don Davis comes in every day from 4:30 to 6:00 to teach basketball and volleyball. In exchange, his children attend ESP for free.

"ESP is great for the organized time of children, the assistance it offers the parents, and last but not least—minimal expenses when compared to other day care centers," explains parent Sherry Cunningham.

Since ESP began in 1986, it has grown to cover all nine elementary schools in the Murfreesboro school district. It now enrolls over 4500 children grades K to 6 throughout Murfreesboro.

Education majors at Middle Tennessee State University form the backbone of ESP's supervisors. They make money while gaining valuable experience in child supervision at the same time. ESP also employs certified teachers for a variety of enrichment activities.

"Our son was ill-tempered, sleepy even after eight hours of sleep, and didn't want to get dressed for school in the mornings, Now, he is ready and eager to get to school so he can join in the before-school program." says Mrs. Eugene Dickson, an ESP parent. "In the afternoon, if he had his way, he would be the last child out the door at 6:00."

Contact:
Becky Bookner, Director
Extended Schools and Community Education
Murfreesboro City Schools
400 North Maple Street
Murfreesboro, Tennessee 37133
(615) 893-2313

Resource Groups

*Indicates groups that are overseeing the development of World Class Standards.

ENGLISH

National Research Center for the Study of Writing
University of California at Berkeley
School of Education
5513 Tolman Hall
Berkeley, California 94720
(510) 643-7022

A source of information from research on writing. Provides leadership to elementary and secondary schools, colleges, and universities as they work to improve the teaching and learning of writing. Funded by the U.S. Department of Education.

ERIC Clearinghouse on Reading and Communication Skills
Indiana University
Smith Research Center
2805 East 10th Street, Suite 150
Bloomington, Indiana 47405-2373
(812) 855-5847

Provides information, referrals, seminars, and training related to research, instruction, and personnel preparation in reading and communication skills.

Great Books Leader Training Courses
The Great Books Foundation
35 East Wacker Drive, Suite 2300
Chicago, Illinois 60601-2298
(800) 222-5870

Trains teachers, volunteers, and librarians to conduct Great Books reading and discussion programs for children and adult literature. Based on the "shared inquiry" method the Great Books Foundation curriculum.

International Reading Association
800 Barksdale Road
P.O. Box 8139
Newark, Delaware 19714-8139
(302) 731-1600

Serves as a clearinghouse for information on reading research through conferences, journals, and other publications.

Literacy Volunteers of America, Inc.
5795 Widewaters Parkway
Syracuse, New York 13214
(315) 445-8000

Offers training and materials for tutors of adults in basic literacy and conversational English.

National Council of Teachers of English
1111 Kenyon Road
Urbana, Illinois 62802
(217) 328-3870

Provides information for teachers on formulating objectives, creating and evaluating curriculum guides, and planning inservice programs for teacher education. Offers reference and referral services.

National Research Center on Literature Teaching and Learning
State University of New York at Albany
School of Education
1400 Washington Avenue
Albany, New York 12222
(518) 442-5006

Examines how literature can affect the ability of all students to think critically and creatively, not only in literature class, but in all areas; and acts as a clearinghouse to promote good practice in the teaching of literature. Focuses on assessment practices, instructional approaches and effective programs for at risk students. Supported by the U.S. Department of Education.

National Research Center on Reading Research and Evaluation
University of Illinois
174 Children's Research Center
51 Gerty Drive
Champaign, Illinois 61820
(217) 333-2552

Conducts research to help the students in our schools become "a nation of readers." Investigates the process of how children learn to read and the role that reading plays in the acquisition of knowledge in the humanities, social sciences, and natural sciences, and disseminates information. Supported by the U.S. Department of Education.

MATHEMATICS

Education Development Center
55 Chapel Street
Newton, Massachusetts 02160
(617) 969-7100

Helps school districts assess their mathematics programs and implement the National Council of Teachers of Mathematics standards. Provides support to the Urban Mathematics Collaboratives, a cooperative network based in 14 cities that seeks to strengthen mathematics education and promote professional development in urban schools across the country. Is collecting exemplary math materials for inclusion on a CD-ROM that will be available to teachers, supervisors, staff developers, and university faculty. Has also developed a variety of educational software packages for mathematics.

ERIC Clearinghouse on Science, Mathematics, and Environmental Education
1220 Chambers Road, Room 311
Columbus, Ohio 43212-1792
(614) 292-6717

Provides information on mathematics and science topics, as well as compilations of promising programs and practices.

National Center for Research in Mathematical Sciences Education
Wisconsin Center for Education Research
University of Wisconsin–Madison
1025 West Johnson Street
Madison, Wisconsin 53706
(608) 263-3605

Has helped several states (notably California) and other groups revise their mathematics curricula in accord with the NCTM standards. Supported by the U.S. Department of Education.

National Council of Teachers of Mathematics*
906 Association Drive
Reston, Virginia 22091
(703) 620-9840

Developed the groundbreaking "math standards," which are laid out in the 1989 report, *Curriculum and Evaluation Standards for School Mathematics*. The report is $25 and can be ordered from 1-800-235-7566. Dedicated to improving mathematics instruction at all levels. Offers a catalog of educational materials to teachers and educators.

National Diffusion Network
Office of Educational Research and Improvement
U.S. Department of Education
555 New Jersey Avenue, NW
Washington, D.C. 20208
(202) 219-2153

Promotes nationwide dissemination and adoption of exemplary educational programs, products, and practices that have received approval from the Program Effectiveness Panel of the U.S. Department of Education. Is dedicated to helping local districts, intermediate service agencies, state departments of education, and secondary institutions in improving educational opportunities for all students. A catalog describing a total of over 400 projects in NDN is available.

National Research Center on Student Learning
Learning Research and Development Center
University of Pittsburgh
3939 O'Hara Street
Pittsburgh, Pennsylvania 15260
(412) 624-7450

Conducts research on thinking and reasoning skills; how content in various subjects is learned and taught; exemplary teaching practices; how to become competent thinkers, learners and problem solvers. Is demonstrating, through Project Quasar, the capability of economically disadvantaged middle school students to learn advanced mathematical content and sophisticated mathematical reasoning skills. Supported by the U.S. Department of Education.

SCIENCE

National Science Resources Center
Arts and Industries Building, Room 1201
Smithsonian Institution
Washington, D.C. 20560
(202) 357-2555

An organization jointly run by the Smithsonian Institution and the National Academy of Sciences, established in 1985, to improve the teaching of science in the nations's schools. Disseminates information on science teaching resources; sponsors outreach activities to help school districts improve their science programs; and develops hands-on science curriculum materials.

American Association for the Advancement of Science
1333 H Street NW
Washington, D.C. 20005
(202) 326-6400

Reviews science education materials and holds a forum each autumn on topics of current interest in science education. Runs an effort known as "Project 2061," which attempts to identify the fundamental concepts of science and mathematics that all students should know. These fundamental concepts are presented in *Science for All Americans*, available for $9.95 at 1-800-451-7556.

CREATE Evaluation and Assessment Laboratory
University of Alabama
P.O. Box 870231
Tuscaloosa, Alabama 35487
(205) 348-1187
Is developing instruments for assessing the effectiveness of science teachers in grades 4 to 8. Uses Expert Science Evaluation Teaching Models (ESETM) to assess both teaching and student behavior.

International Clearinghouse for Advancement of Science Teaching
University of Maryland
Benjamin Building
College Park, Maryland 20742
(301) 405-3161

Provides information about science and mathematics curricula, offers reference and referral service, and conducts training and workshops.

Lawrence Hall of Science
University of California, Berkeley
Berkeley, California 94720
(510) 642-5132

The Mission of the Lawrence Hall of Science is to increase public understanding of science. Offers new ideas, experience with the latest equipment and teaching techniques, and summer jobs in industry settings to some 12,000 teachers each year. Has developed a host of innovative hands-on science programs for children and has pioneered preschool science education, with the aim of reaching children before they become bored or intimidated by science. Used in more that 20 percent of the nation's schools, the Science Curriculum Improvement Study (SCIS) was the first laboratory-based curriculum for elementary school children. Outdoor Biology Instructional Strategies (OBIS) introduces students to environmental and biological concepts using their local parks and communities as laboratories.

National Academy of Science*
2101 Constitution Avenue NW
Washington, D.C. 20418
(202) 334-2000

Is leading the effort to develop World Class Standards in science. NAS has been a leader in the mathematics reform movement through the Mathematical Sciences Education Board and is now attempting to bring consensus to the science fields as well.

National Center for Improving Science Education
The Network, Inc.
2000 L Street, Suite 603
Washington, D.C. 20036
(202) 467-0652

Identifies the gaps in science education and prepares reports, guidebooks, and other publications to bridge research and practice in science assessment, science curricula, and science teaching. Has produced materials for strengthening science education at the elementary, middle, and high school levels.

National Center for Science Teaching and Learning
The Ohio State University
Room 104, Research Center
1314 Kinnear Road
Columbus, Ohio 43212-1194
(614) 292-3339

Is conducting research on the external factors influencing science teaching and learning. Focuses its research activities in the following areas that influence science education: (1) social and cultural factors; (2) public expectations and societal incentives; (3) school organization and policy; (4) new technologies; (5) integration of science across curriculum; and (6) economic and political forces.

National Science Teachers Association
1742 Connecticut Avenue NW
Washington, D.C. 20009
(202) 328-5800

Largest organization in the world committed to the improvement of science education. Supports major programs, such as the Scope,

Sequence, and Coordination of Secondary School Science Project, and is the source of various publications in the field.

Smithsonian Institution Office of Elementary and Secondary Education
Arts and Industries Building, Room 1163
Smithsonian Institution
Washington, D.C. 20560
(202) 357-2425

The Smithsonian Institution's central education office helps teachers incorporate museums and other community resources into their curricula. Encourages experiential object-based learning of topics such as the phenomenon of sight and animal behavior. Seminars, courses, symposia, and internship programs are offered.

SCIENCE COMPETITIONS AND OLYMPIADS

Science competition programs for students identify, reward, and encourage secondary school students who excel in science. For example, the Olympiads are programs at very high levels of international competition for extremely able students. A rigorous selection process results in teams of students who travel abroad for several days of tests and activities.

U.S. National Chemistry Olympiad
American Chemical Society
1156 16th Street
Washington, D.C. 20036
(202) 872-6169

International Mathematical Olympiad
MAA Committee on American Mathematics Competitions
Mathematics Department
University of Nebraska
Lincoln, Nebraska 98588
(402) 472-2257

International Physics Olympiad
5112 Berwyn Road
College Park, Maryland 20740

HISTORY

National Center for History in the Schools*
University of California
Moore Hall 234
405 Hilgard Avenue
Los Angeles, California 90024-1521
(310) 825-8388

Is leading a national effort to develop World Class Standards in American History and world history. Also, has developed curricular units on subjects such as the ancient Near East, China under the Han dynasty, and America in colonial times. Supported by the U.S. Department of Education and the National Endowment of the Humanities.

National Council for History Education
26915 Westwood Road
Suite B-2
Westlake, Ohio 44145-4656
(216) 835-1776

Successor organization of the Bradley Commission on History in Schools, which published *Building a History Curriculum: Guidelines for Teaching History in School*. Acts as a clearinghouse of information on history in education, provides a network for history educators, as well as publishing a monthly newsletter for parents, educators, and policy makers.

American Federation of Teachers Education for Democracy Project
American Federation of Teachers
555 New Jersey Avenue
Washington, D.C. 20001
(202) 879-4400

Supports improving citizenship education and history in American schools.

ERIC Clearinghouse for Social Studies
Indiana University
Social Studies Development Center
2805 East 10th Street, Suite 120
Bloomington, Indiana 47405-2373
(812) 855-3838

Provides information pertaining to the teaching and learning of history, geography, civics, economics, and other subjects in the social studies/social sciences.

National Council for the Social Studies
3501 Newark Street, NW
Washington, D.C. 20016
(202) 966-7840

Promotes the teaching of social studies at all levels and provides information and resources to social studies teachers in all 50 states and more than 69 foreign countries.

GEOGRAPHY

American Geographical Society
156 Fifth Avenue
Room 600
New York, New York 10010
(212) 242-0214

Presents lectures, conferences and symposia, awards honors to scholars and explorers, conducts research on a wide range of geographical topics, and has amassed the largest geographical research library in the Western Hemisphere. Involved in improving geographical education, sponsors educational travel programs, and promotes better geographical education in grades K through 12.

Commission of Geographical Education
International Geographical Union
Department of Geography
Western Michigan University
Kalamazoo, Michigan 49008
(616) 387-3410

Helps nations develop a sound system of geographical education, disseminates information regarding curriculum development in geography, and provides a center for international funding of research projects. Created the international charter of geographical education, which sets guidelines for the teaching of geography in elementary and secondary schools.

ERIC Clearinghouse for Social Studies/Social Science Education
Indiana University
Social Studies Development Center
2805 East 10th Street, Suite 120
Bloomington, Indiana 47405-2373
(812) 855-3838

Offers information pertaining to the social studies/social sciences fields, including issues about the teaching and learning of history, geography, civics, economics, and other subjects in the social studies/social sciences. Develops and disseminates publications related to instructional improvement in these fields. Supported by the U.S. Department of Education.

National Council for Geographic Education*
Indiana University of Pennsylvania
Geography Department
Leonard Hall, Room 16A
Indiana, Pennsylvania 15705-1087
(412) 357-6290

Is overseeing development of World Class Standards in geography. Encourages the training of teachers in geographic concepts, practices, and teaching methods and improves the teaching and learning of geography in schools as well as among adult groups outside schools. Publishes the *Journal of Geography*, the newsletter *Perspective*, and *Pathways in Geography*, a series of publications for teachers, students, teacher trainers and curriculum planners.

National Geographic Society Education Foundation
1615 M Street, NW, Suite 580
Sumner Building
Washington, D.C. 20036
(202) 828-6672

Supports a state-based network of geographic alliances which provide opportunities for teachers to beef up their knowledge about teaching geography—opportunities that include summer institutes and after-school workshops. Alliances are now active in at least 9 states.

National Geographic Society Geography Education Program
17th and M Streets, NW
Washington, D.C. 20036
(202) 775-6701

Brings together academic geographers and K through 12 teachers through a network of state geographic alliances based on university campuses across the country. Interested K-12 teachers may ask to be placed on the mailing list. All teachers on the mailing list will receive a packet of information during Geographic Awareness week. Publishes *Update*, a free, periodic newsletter that includes geography lesson plans. Sponsors summer teacher-education institutes in Washington, D.C. and several states, and sponsors teacher workshops in all states and territories. Through alliances, encourages the development of educational materials appropriate to state and local curricula.

CIVICS

Center for Civic Education
5146 Douglas Fir Road
Calabasas, California 91302
(818) 591-9321

Develops educational programs and instructional materials in civic education and conducts programs to improve the teaching of civics and government in the nation's elementary and secondary schools.

ARTS

Consortium of National Arts Education Associations*
Music Educator's National Conference
1902 Association Drive
Reston, Virginia 22091
(703) 860-4000

Currently in the process of developing World Class Standards in the Arts. Communities can be placed on a mailing list to receive progress reports and drafts of the standards.

Getty Center for Education in the Arts
1875 Century Park East, Suite 2300
Los Angeles, California 90067-2561
(310) 395-6657

Dedicated to improving the quality and status of arts education in the nation's schools. Its long range goal—to help students acquire an informed understanding of art—is fundamental to all the center's activities which fall into five categories: professional development, curricular development, model programs, theoretical materials, and advocacy.

John F. Kennedy Center for the Performing Arts
New Hampshire Avenue at Rock Creek Parkway
Washington, D.C. 20566
(202) 416-8800

The education department within the Kennedy Center is designed to transmit the vision of the Kennedy Center by fostering understanding of and participation in the performing arts through exemplary educational programs and performances.

Nashville Institute for the Arts
114 Thirtieth Avenue South
Nashville, Tennessee 37212
(615) 329-6740

Develops and promotes cultural literacy and education in the arts through a series of programs for adults and young people.

PHYSICAL EDUCATION

National Association for Sports and Physical Education
1900 Association Drive
Reston, Virginia 22091
(703) 476-3410

Devoted exclusively to improving the total sport and physical education experience in America by disseminating knowledge about physical education among professionals and the general public. Through it's membership network, NASPE has the capability of reaching every school in the country with projects designed to improve the sport and physical education experience.

President's Council on Physical Fitness and Sports
701 Pennsylvania Avenue., NW, Suite 250
Washington, D.C. 20004
(202) 272-3432

Serves as a catalyst to promote, encourage and motivate the development of physical fitness and sports programs for all Americans.

Institute for Aerobics Research
12330 Preston Road
Dallas, Texas 25230
(214) 701-8001

A non-profit research and education center dedicated to advancing the understanding of the relationship between living habits and health and to providing leadership in implementing these concepts to enhance the physical and emotional well-being of individuals.

Further Reading

ENGLISH *(READING)*

Becoming a Nation of Readers: The Report of the Commission on Reading. R. Anderson et al. Champaign, IL: Center for the Study of Reading, 1985. Presents leading expert interpretations of both current knowledge of reading and practice of teaching reading.

Handbook of Reading Research, Volume 11. R. Barr, M.L. Kamil, P. Mosenthal, and D. Pearson Eds. White Plains: Longman Publishing Group, 1991. This second volume of research in the field of reading examines literacy through a variety of perspectives.

Learning to Read: The Great Debate. J.S. Chall. New York: McGraw-Hill, 1967. This study concludes that the first task in learing to read is learning the relation between sounds and letters—decoding. The second task is reading for content and meaning.

Modifying Reading Instruction to Maximize Its Effectiveness For All Students, Technical Report No. 489. G.E. Garcia and P.D. Pearson. Champaign, IL: The Center for the Study of Reading, University of Illinois at Urbana-Champaign, 1990. Discusses how reading instruction should be modified to help all students, especially low-achieving students, develop strategies for comprehending what they read.

New Policy Guidelines for Reading: Connecting Research and Practice, Report No. 33428-1234. J.C. Harste. Urbana, IL: National Council of Teachers of English, 1989. Presents policy guidelines that emphasize a functional "low-risk" curriculum in which reading and writing are viewed as tools for learning.

ENGLISH *(LITERATURE)*

"The Limits of Pluralism: Deconstructive Angel." M.H. Abrams. *Critical Inquiry,* 3:425-38, 1977. States the principles and merits of the traditional approach to literature while countering the deconstructive and other post-structural approaches.

Literature and U.S. History: The Instructional Experience and Factual Knowledge of High School Juniors. A.N. Applebee, J.A. Langer, and I.V.S. Mullis. Princeton, NJ: Educational Testing Service, 1987. A summary of

eleventh grade students' factual knowledge of literature and U.S. history which indicates that although they have some knowledge upon which to build, student's memory of literature facts lags behind social studies knowledge.

California State Department of Education, *Recommended Readings in Literature*, Sacramento, CA: Bureau of Publications Sales/California State Department of Education, 1989, 1990. A list of recommended readings developed by the California State Department of Education for use in California schools.

Cultural Literacy: What Every American Needs to Know. E.D. Hirsch, Jr. Boston, MA: Houghton-Mifflin, 1987. Argues that schools should teach a common core of knowledge to all students.

What Do Our 17-Year-Olds Know? D. Ravitch and C. Finn. New York, NY: Harper and Row Publishers, 1987. Outlines the results of the first National Assessment of Educational Progress (NAEP) that assessed 17-year-old student's knowledge of history and literature.

ENGLISH *(WRITING)*

"Using Writing to Learn in History," B.K. Beyer. *History Teacher*, 13 (February) 167-78, 1980. Discusses the writing-across-the-curriculum approach where writing in a specific discipline increases one's knowledge of that discipline.

Center for the Study of Writing, *Final Report of the Center for the Study of Writing*, Berkeley, CA: University of California, 1990. Details the work of the Center for the Study of Writing, including how written language is acquired and best taught. Writing by diverse populations of learners and writing to learn in school across the curriculum is also taught.

Critical Challenges for Research on Writing and Literacy: 1990-1995, Technical Report No. 1-B. A.H. Dyson and S.W. Freedman. Berkeley, CA: Center for the Study of Writing, 1991. Reviews the challenges for literacy development in helping educators improve their abilities to help all members of society become literate - across grade levels, social classes, language and ethnic groups, and educational settings.

On Teaching Writing: A Review of the Literature, Occasional Paper No. 20. A. H. Dyson and S.W. Freedman. Berkeley, CA: National Research Center on Writing and Literacy at the University of California, 1990.

Reviews interrelated research about writing that may help focus teacher observations, deepen insight and inform the crucial decisions teachers make about how best to support their students' efforts.

Research on Written Composition: New Directions for Teaching. G. Hillocks, Jr. District of Columbia: ERIC Clearinghouse on Reading and Communication Skills, 1986. Summarizes and evaluates major writing research from the early 1960s to the early 1980s.

Grammar and the Teaching of Writing: Limits and Possibilities, Report No. 18747-1234. R.R. Noguchi. Urbana, IL: National Council of Teachers of English, 1991. Argues that the main reason formal grammar instruction does not help students improve their writing is that teachers have unrealistic expectations of what grammar can do.

Cultivating Thinking in English and the Language Arts, Report No. 09918-1234. R.J. Marzano. Urbana, IL: National Council of Teachers of English, 1991. Asserts that instruction in English and the language arts can nurture students' thinking processes.

James Madison Elementary School: A Curriculum for American Students. U.S. Department of Education. Washington, DC, 1988. Describes the body of knowledge, the common language of ideas, and the intellectual rigor required of a comprehensive elementary school curriculum.

James Madison High School: A Curriculum for American Students. U.S. Department of Education. Washington, DC, 1987. Describes the body of knowledge, the common language of ideas, and the intellectual rigor required of a comprehensive high school curriculum. Also provides course descriptions and sample student schedules.

MATHEMATICS

Special issue devoted to implementation of the California Mathematics Framework. D.K. Cohen and D.L. Ball et al. *Education Evaluation and Policy Analysis*. Vol. 12:233-353, 1990. Focuses on the implementation of the California Mathematics Framework.

The Mathematics Report Card: Are We Measuring Up? John A. Dossey et al. Princeton, NJ: Educational Testing Service, 1988. A report of trends and achievement in mathematics based on the 1986 National Assessment of Educational Progress (NAEP).

"Mathematics teachers reconceptualizing their roles." C. Lovitt, M. Stephens, D. Clarke, and T.A. Romberg. In T.J. Cooney and C.R. Hirsch, Eds., *1990 NCTM Yearbook: Teaching and Learning Mathematics in the 1990s*, Reston, VA: The National Council of Teachers of Mathematics, 1990. A compilation of 28 independent articles addressing current issues in mathematics education.

Moving Beyond Myths: Revitalizing Undergraduate Mathematics. National Research Council. Washington, DC: National Academy Press, 1991. Analyzes the weakness of college undergraduate mathematics education and proposes goals and an action plan for upgrading this area.

Everybody Counts: A Report to the Nation of the Future of Mathematics Education. National Research Council. Washington, DC: National Academy Press, 1989. A synthesis of the thinking of 70 prominent Americans in the developmental years of the Mathematical Sciences Education Board (MSEB).

Reshaping School Mathematics: A Philosophy and Framework for Curriculum. National Research Council. Washington, DC: National Academy Press, 1989. Proposes a framework for the reform of school mathematics.

Renewing U.S. Mathematics: A Plan for the 1990s. National Research Council. Washington, DC: National Academy Press, 1989.

Classroom Instruction Which Fosers Mathematical Thinking and Problem Solving: Connections Between Theory and Practice. T.A. Romberg. Madison, WI: National Center for Research in Mathematical Sciences Education, 1990.

On the Shoulders of Giants: New Approches to Numeracy. Lynn Arthur Steen, Ed. Washington DC: National Research Council, National Academy Press, 1990. A series of six essays on strands that can be woven through K-12 mathematics: pattern, dimension, quantity, uncertainty, shape, and change.

"How Asian Teachers Polish Each Lesson to Perfection." J.W. Stigler and H.W. Stevenson. In *American Educator* (Spring), pp. 12-20, 43-47, 1991.

The Learning Gap: Why Our Schools Are Failing and What We Can Learn from Japanese and Chinese Education. H.W. Stevenson. New York: Summit Books, 1992.

SCIENCE

Essential Changes in Secondary School Science: Scope, Sequence, and Coordination. Bill G Aldridge. Washington, DC: National Science Teachers Association, 1989. A document describing the three research based findings (scope, sequence, coordination) and reasons for the development of the SS&C curriculum being carried out in 5-6 sites across the nation.

Sourcebook for Science, Mathematics & Technology Education, 1990-91. American Association for the Advancement of Science. Washington, DC: Author, 1990. An excellent resource of all the addresses and contacts for the major professional, federal, and non-profit offices, officers (in some cases members) for science and mathematics in the nation.

Promising and Exemplary Programs and Materials in Elementary and Secondary Schools - Science. Stanley Helgeson, et al. Columbus, OH: ERIC Clearinghouse for Science, Mathematics, and Environmental Education, Ohio State University, 1990.

The Science Report Card: Elements of Risk and Recovery. Ina V. S. Mullis et al. Princeton, NJ: Educational Testing Service, 1988.

Fulfilling the Promise: Biology Education in the Nation's Schools. National Research Council. Washington, DC: National Academy Press, 1990.

Science for Children: Resources for Teachers. National Science Resources Center. A resource guide of the major hands-on science and math/science curriculum projects for elementary-middle school. Gives a summary, evaluation-review, and sources for each. Washington, DC: National Academy Press, 1988.

The State of Science Education. S. Raizen. In S.K. Majumdar et al (eds.), *Science Education in the United States: Issues, Crises, and Priorities*. Easton, PA: The Pennsylvania Academy of Science, 1991. Offers a historical prospective of science education since the 60's and its implications for reform and activities in the field today.

Education and Learning to Think. L. Resnick. Washington, DC: National Academy Press, 1987.

Case Studies in Science Education (Vols. 1-2). R.E. Stake and J. Easley. Urbana: University of Illinois, Center for Instructional Research and Curriculum Evaluation, 1978.

Science Teacher Education. R.E. Yager and J.E. Penick. In W.R. Houston, (ed.) Handbook of Research on Teaching. New York: MacMillan, 1990. A brief description of the history of science teacher education which contributed or led to current issues, including descriptions of model practices in teacher education.

HISTORY

Historical Literacy: The Case for History in American Education. Paul Gagnon. New York, NY: MacMillan, 1989. Paperback edition, Houghton-Mifflin, 1991. A follow-up volume to the Bradley Commission report. Extends the arguments and spells out the implications of the Commission's report. Includes a reprint of the report.

"Why Study History," Paul Gagnon. *Atlantic Monthly*, November 1988, pp. 43-66. Presents an argument for the importance of studying history.

"E Pluribus Unum," Donald Kagan. Address to the Yale College Class of 1994, September 1990, (Duplicated). Argues for placing Western Civilization at the center of our students' studies.

"Tot Sociology or What Happened to History in the Grade Schools," Diane Ravitch. *American Scholar*, Vol. 56, Summer 1987, pp. 343-354. Analyzes the inadequacy of the social studies curriculum in the early primary school grades.

"What Do Our 17-Year Olds Know?," Diane Ravitch and Chester E. Finn, Jr. A Report on the First National Assessment of History and Literature. New York, NY: Harper and Row, 1987. A national survey, conducted in early 1986, of the knowledge of history and literature of 8,000 17-year olds. Also includes proposals for improving the teaching and learning of history and literature.

"Clio Has a Problem," Simon Schama. *The New York Times Magazine*, September 8, 1991. Argues that historical writing and instruction needs to be restored to the narrative forms by which it can catch the public's imagination.

GEOGRAPHY

Teaching Geography in American History. Alan Backler. Bloomington, IN: ERIC Clearinghouse for Social Studies/Social Science Education, ED 299 222, 1988. This ERIC Trends Issues paper recommends that geography core themes be infused into high school U.S. history courses, and suggests an approach for using similar themes to develop ideas in both topics.

World Geography and National Security. Alan Backler and William Sabata. Columbus, OH: Mershon Center, Ohio State University, 1990. 29 lessons applying basic geographic concepts are used to illustrate how geography relates to security considerations. Physical, political, and cultural aspects of geography are examined.

Geography Education and the States: A Report on a 1988 Geography Education Survey of State Education Agencies. Council of Chief State School Officers. Washington, DC, 1988. This survey of the nation's state education agencies gathered data on requirements, integration, state personnel, teacher training, and suggestions for improvement in geography education in elementary and secondary schools.

Helping Your Child Learn Geography. Carol Sue Fromboluti. Washington, DC: U.S. Department of Education, 1990. Provides practical learning activities for parents to teach geography to children under age 10.

K-6 Geography: Themes, Key Ideas, and Learning Opportunities. Geographic Education National Implementation Project. Malcomb, IL: National Council for Geographic Education, 1987. An implementation guide which gives resources for preparing daily lesson plans, curriculum guidelines, and resource materials.

Geography in U.S. History: A Teacher's Guide. Kenneth Goodall Bloomington, IN: Agency for Instructional Technology, 1991. Provides teachers with materials to infuse the teaching of geographic concepts and skills into high school American history courses.

Directions in Geography: A Guide for Teachers. Gail S. Ludwig et al. Washington, DC: National Geographic Society, 1991. Helps teachers ignite interest in geography by integrating geography's five themes into the classroom. Includes lesson plans with reproducible black-line maps, an annotated bibliography of teaching resources, and information on the National Geographic Society's activities in geography education.

Missing the Magic Carpet: The Real Significance of Geographic Ignorance. Christopher L. Salter. Princeton, NJ: Education Testing Service, 1990. Analyzes National Assessment of Educational Progress (NAEP) findings and makes suggestions to parents, teachers, and administrators about specific actions they can take to improve geography learning in America's schools.

Geographic Education for Citizenship. Joseph P. Stoltman. Bloomington, IN: ERIC Clearinghouse for Social Studies/Social Science Education, ED 322 081, 1990. Examines the ways that geography education has contributed to citizenship education.

Teaching Geography at School and Home. Joseph P. Stoltman. Bloomington, IN: ERIC Clearinghouse for Social Studies/Social Science Education, ERIC Digest EDO-SO-91-5, 1991. This Digest discusses (1) what students should learn about geography, (2) what to do at school to improve the geography learning of students, and (3) what to do at home to improve the geography learning of children.

CIVICS

At Last - "A Civics Lesson for All of Us". R. Freeman Butts. Working Papers in Education No. ED-92-20. Stanford, Ca.: The Hoover Institution, Stanford University, 1992. The author makes a strong case for civic education in the core curriculum of schools.

We the People: A Review of U.S. Government and Civics Textbooks. J.D. Carroll, W.D. Broadnax, G. Contreras, T.E. Mann, N.J. Ornstein, and J. Stiehm. Washington, DC: People for the American Way. A review of leading textbooks that reveals the serious shortcomings of these volumes.

"The American School in the Political Socialization Process." L.H. Ehman. *Review of Educational Research* 50(Spring 1980):100-113. Review of research about learning of political knowledge and attitudes in schools.

Education, Character, and American Schools. Gerald Grant. Washington, DC: Ethics and Public Policy Center, 1981. Study of the impact of school on moral education.

Social Studies Reform: 1880-1980. Hazel Hertzberg. Boulder, CO: Social Science Education Consortium, 1981. A history of curriculum reform in social studies that examines trends and failures.

Thinking Historically: Narrative, Imagination, and Understanding. Tom Holt. New York: College Entrance Examination Board, 1990.

Schools and Civic Values. John J. Patrick. Trends/Issues Paper No.2. Bloomington, IN.: ERIC Clearinghouse for Social Studies/Social Science Education, Indiana University, 1988. Review of research on the impact of classroom instruction, school climate, and non-school factors on the development of civic values.

"Making, Judging and Influencing Political Decisions: A Focus for Citizen Education." Richard C. Remey. *Social Education* 40: 360-365. Discussion of a decision-making strategy as a central element of civic education.

Toward the Thinking Curriculum: Current Cognitive Research. Lauren B. Resnick and Leopold E. Klopher, eds. Alexandria, VA: Association for Supervision and Curriculum Development, 1989.

Informal Reasoning and Education. James F. Voss, David N. Perkins, and Judith W. Segal, eds. Hillsdale, N.J.: Lawrence Erlbaum Associates, 1991.

"Models of Wisdom in the Teaching of History." Samuel S. Wineburg and Suzanne M. Wilson. *Phi Delta Kappan* 70 (September 1988): 50-58.

"Subject-Matter Knowledge in the Teaching of History." Samuel S. Wineburg and Suzanne M. Wilson. In *Advances in Reasearch on Teaching,* ed. by J.E. Brophy. 22:305-347. Greenwich, CT: JAI Press, 1991.

ARTS EDUCATION

Understanding How Arts Contributes to Excellent Education. OMG, Inc. for the National Endowment for the Arts. 1991. A summary of an 18 month study of various art projects used in schools across the country. Results show that arts education enhances all areas of education.

Toward Civilization. National Endowment for the Arts. 1988. A report on arts education and it's importance in curriculum.

Cultural Literacy and Arts Education. Ralph A. Smith. University of Illinois Press. 1991. Links knowledge and understanding of the arts with greater cultural literacy.

National Arts Education Accord. A collaborative work by The American Alliance for Theatre and Education, Music Educators National

Conference, National Art Education Association, and the National Dance Association. Offers a summary of the four disciplines that arts education falls into: art, theatre, dance and music, and gives suggestions for what teachers can do to prepare students for arts awareness.

FOREIGN LANGUAGE

Proficiency Guidelines. American Council on the Teaching of Foreign Languages (ACTFL). Hastings-on-Hudson, NY: ACTFL. 1986. Guidelines for assessing proficiency in speaking, listening, reading, and writing a foreign language.

New Perspectives and New Directions in Foreign Language Education. Diane W. Birckbichler, ed. Lincolnwood, IL: National Textbook Company. 1990. Leading educators examine major issues such as factors that determine and influence language policy and planning at the local, state, national, and international levels, the necessity of designing and organizing carefully articulated programs, the impact of trends in teacher training and certification on teacher effectiveness, competencies for teachers of tomorrow, and the influence of the results of research on learning styles and strategies on classroom practice.

Languages and Children: Making the Match. Helena A. Curtain and Carol Ann Pesola. Reading, MA: Addison Wesley, 1988. Designed both as a methods text and as a practical guide for K-8 school districts and for teachers providing foreign-language instruction.

Directory of U.S. Elementary and Secondary Schools Teaching Arabic, Chinese, Japanese, Russian, 1991. Washington, DC: Friends of International Education, Institute for Crucial Languages. 1990. The first comprehensive roster of U.S. elementary and secondary school programs in Arabic, Chinese, and Russian, grouped by region; current programs are indexed by language.

Dreams, Realities and Nightmares: The Present and Future of Foreign Language Education in the United States. Jamie B. Draper. Washington, DC: Joint National Committee for Languages. Presents the findings of a questionnaire sent to individuals responsible for foreign-language education at the state level. Urges long sequences of language study as well as continuity between elementary, middle-school, and high school programs.

The State of the States: State Initiatives in Foreign Languages and International Studies. Washington, DC: Joint National Committee for Languages. Presents findings of a survey of state foreign language supervisors and others responsible for international education at the state level concerning changes in foreign language instruction in their states during the 1980s.

"The Effect of Foreign Language Study in High School on Verbal Ability as Measured by the Scholastic Aptitude Test- Verbal." Peter A. Eddy. Washington, DC: Center for Applied Linguistics. 1981. Reports findings of a Montgomery County, Maryland, study to determine the effect of foreign-language study on performance on the verbal section of the Scholastic Aptitude Test (SAT).

Foreign Language Annals. Vol. 23, no. 5. 1990. The articles in this issue of FLA address various topics including: types of foreign-language testing, instructional technologies, advances made in elementary-level foreign-language instruction, and particular concerns of foreign-language teachers ranging from learning more about language programs in other countries to developing more opportunities for teachers to maintain and develop both their teaching and their language skills.

Foreign Language Annals. Vol. 24, no. 2, 1991. The articles in this issue of FLA address the following topics: the broadening foreign language research, current status and needs of foreign-language teacher training, the cultural understanding that should accompany instruction in a foreign language, and factors currently influencing instruction of less commonly taught languages.

"Using FLES History to Plan for the Present and Future." Audrey Heining-Boynton. *Foreign Language Annals* 23 (no. 6): 503-9. 1990. Gives a history of FLES (foreign language in elementary schools) in the United States and offers a checklist for new practitioners and administrators of existing foreign-language programs to use as a means of self-evaluation.

"Tangible Benefits of the Study of Latin: A Review of Research." Rudolph Masciantonio. *Foreign Language Annals* 10 (no.4): 375-82. Examines the linguistic benefits of Latin in light of research documenting the relevance of Latin in building English vocabulary and reading skills.

Distance Learning in Foreign Languages: A Position Paper with Guidelines: NCSSFL. National Council of State Supervisors of Foreign Languages. 1990. Outlines the NCSSFL's position on distance learning. Concludes

that the technique may be a viable method of foreign-language instruction in areas where there is a shortage of qualified teachers. Offers guidelines for approving and monitoring distance learning programs.

Critical Issues in Foreign Language Education. Ellen S. Silber, ed. New York: Garland Publishing, 1990. Explores the major issues in current foreign-language education, including the psychology of second-language learning. English as a second language, assessment, foreign languages in the elementary school, progiciency, teaching materials, use of technology, foreign language for business, cultural implications, undergraduate and graduate literature and culture curriculum, teacher training, preparation of assistants, and teacher renewal.

Documents for Setting Standards Today

National efforts are underway to create World Class Standards in the core subjects. In the meantime, many communities may want to take advantage of standards in some subjects already available.

ENGLISH

The Core Knowledge Sequence, (revised) 1992.
Outlines specific information to provide all elementary school students with a common knowledge base. Designed to complement and supplement regular school curriculum guidelines and procedures.

Available from the Core Knowledge Foundation
2012-B Morton Drive
Charlottesville, VA 22901
(800) 238-3233
Price: $12.50 per copy; discounts available

English-Language Arts Framework for California Public Schools, K-12, 1987.
Provides teachers, administrators, parents and publishers with an understanding of the State of California's philosophy of English education. It directly relates to English-language arts curriculum standards and guidelines published by the California Department of Education.

Available from the California Department of Education
Publicity/Sales Department
P.O. Box 271
Sacramento, CA 95812
(916) 445-1260
Price: $3.00 per copy; quantity discounts available.

Supplemental Materials from the California Department of Education:

Recommended Readings in Literature, K-8, Annotated Edition, 1988.
Recommended Readings in Literature, Grades 9-12, 1990.
Compiled by California teachers, librarians, and administrators to assist local schools in offering diverse, high quality works of literature.
Price: $4.50 per copy, quantity discounts available.

Reading Objectives: 1990 Assessment, 1989.
Objectives being used to develop the National Assessment of Educational Progress in reading. Created by a national consensus process involving reading specialists, curriculum specialists, teachers and school administrators.

Available from the Community Service Center
U.S. Department of Education
Room 4141
400 Maryland Avenue, SW
Washington, DC 20202
(202) 401-0039

Writing Assessment Framework for the 1994 National Assessment of Educational Progess (draft), 1992.
Objectives being used to develop the National Assessment of Educational Progress in writing. Created by a national consensus process involving reading specialists, curriculum specialists, teachers and school administrators.

Available from the Community Service Center
U.S. Department of Education
Room 4141
400 Maryland Avenue, SW
Washington, DC 20202
(202) 401-0039

MATHEMATICS

Curriculum and Evaluation Standards for School Mathematics, 1989.
Created by a national group of experts and teachers of mathematics. Establishes 54 standards for mathematics achievement.

Available from the National Council of Teachers of Mathematics
Order Processing
1906 Assocation Drive
Reston, VA 22091
(800) 235-7566, extenstion 135
Fax: (703) 476-2970
Price: $25.00 per copy; quantity discounts available.

Supplemental Materials from NCTM:

Curriculum and Evaluation Standards Addenda Series
Developed to complement the NCTM Standards. Includes 22 volumes, each offering activity suggestions, teacher resources and assessment criteria for specific grade levels and content areas.

Price: $17.00 per volume; quantity discounts available.

Mathematics Framework for California Public Schools, K-12, 1992.
Expands upon the reform-oriented 1985 Mathematics Framework. Includes general goals and objectives as well as specific suggestions and alternatives to meet those goals.

Available from the California Department of Education
Publicity/Sales Department
P.O. Box 271
Sacramento, CA 95812
(916) 445-1260
Price: $5.50 per copy; quantity discounts avaliable.

SCIENCE

Science for All Americans, 1989.
Published by the American Association for the Advancement of Science. Examines the substance and character of scientific education for all citizens. Defines common knowledge required for scientific literacy.
Available from the Oxford University Press

Order Department
2001 Evans Rd.
Cary, NC 27513
(800) 451-7556
Price: $9.95 per copy paperback, $24.95 hardbound; quantity discounts available

Science Framework for California Public Schools, K-12, 1990.
Provides discussion of pedagogical approaches and processes such as the scientific method, as well as specific recommendations for systemic

reforms in science education, including suggestions for attracting more students into science classes.

Available from the California Department of Education
Publicity/Sales Department
P.O. Box 271
Sacramento, CA 95812
(916) 445-1260
Price: $6.50 per copy; quantity discounts available.

Science Assessment Framework for the 1994 National Assessment of Educational Progress (draft), 1992.
Objectives being used to develop the National Assessment of Educational Progress in science. Created by a national consensus process involving scientists, curriculum specialists, teachers and school administrators.

Available from the Community Service Center
U.S. Department of Education
Room 4141
400 Maryland Avenue, SW
Washington, DC 20202
(202) 401-0039

HISTORY

Building a History Curriculum: Guidelines for Teaching History in Schools, 1988.
Outlines six "Vital Themes" to be considered in the study of history, which can be used in designing and implementing a history curriculum.

Available from the National Council for History Education, Inc.
26915 Westwood Rd.
Suite B-2
Westlake, OH 44145
(216) 835-1776
Price: $3.00 per copy, quantity discounts available.

History-Social Science Framework for California Public Schools, K-12, 1988.
Outlines and organizes historical facts and concepts into a chronological, sequential system. Includes civic education.

Available from: the California Department of Education
Publicity/Sales Department
P.O. Box 271
Sacramento, CA 95812
(916) 445-1260
Price: $6.00 per copy: quantity discounts available

Lessons from History: Essential Understandings and Historical Perspectives Students Should Acquire
Written by historians, curriculum leaders and classroom teachers. Identifies historical themes and understandings to be taught in grades K-12. A resource for setting standards and developing assessments, for teachers, curriculum planners and policy makers.

Available from the National Center for History
Attention: Pamela Hamilton
UCLA
Moore Hall 231
405 Hilgard Ave
Los Angeles, CA 90024-1521
(310) 825-4702
Price: $17.50 per copy; quantity discounts negotiable

GEOGRAPHY

Guidelines for Geography Education: Elementary and Secondary Schools, 1984.
Employs five fundamental themes of geography to serve as guidelines for general geographic concepts, course offerings and student achievement.

Available from the National Council for Geography Education
16 A Leonard Hall
Indiana University of Pennsylvania
Indiana, PA 15705
(412) 357-6290
Price: $3.00 per copy; quantity discounts available

Supplemental Materials from the NCGE:

K-6 Geography: Themes, Key Ideas and Learning Opportunities, 1987.
7-12 Geography: Themes, Key Ideas and Learning Opportunities, 1989.
Serve as a resource for key concepts and actual classroom activities. Expand upon and illustrate examples for implementation of the Guidelines for Geographic Education.
Price: $6.00 per copy; quantity discounts available

Geography Assessment Framework for the 1994 National Assessment of Educational Progress (draft), 1992.
Objectives being used to develop National Assessment of Educational Progress in geography. Created by a national consensus process involving geographers, curriculum specialists, teachers and school administrators.

Available from the Community Service Center
U.S. Department of Education
Room 4141
400 Maryland Avenue, SW
Washington, DC 20202
(202) 401-0039

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Available from the California Department of Education
Publicity/Sales Department
P.O. Box 271
Sacramento, CA 95812
(916) 445-1260
Price: $6.00 per copy: quantity discounts available

CIVICS

CIVITAS: A Framework for Civic Education, 1991.
Developed by the Center for Civic Education and the Council for the Advancement of Citizenship. Designed to guide curriculum designers, teachers, and administrators as they design a program to enable students to gain an understanding of the fundamental concept of citizenhood, and the rights and responsibilities that accompany it.

Available from Maxway Data Corporation
225 W. 34th Street, Suite 1105
New York, NY 10001
(800) 683-0812
Fax: (212) 563-5703
Price: $50.00 per copy; quanitity discounts available.

History-Social Science Framework for California Public Schools, K-12, 1988.
Outlines and organizes historical facts and concepts into a chronological, sequential system. Includes civic education.

Available from the California Department of Education
Publicity/Sales Department
P.O. Box 271
Sacramento, CA 95812
(916) 445-1260
Price: $6.00 per copy: quantity discounts available

ARTS

Model Learner Outcomes for Art Education, 1991.
Sets standards for artistic knowledge and abilities for students. Includes evaluation criteria.

Available from the Minnesota Curriculum Services Center
70 West County Road B-2
Little Canada, MN 55117
(800) 652-9024
(612) 483-4442
Fax: (612) 483-0234
Price: $5.50 (MN residents)
$8.00 (non-residents); quantity discounts available.

School Music Program: Description and Standards, 1986
Contains philosophy of music education, suggests subject matter mastery levels for students of all ages, and provides administrative and pedagogical standards and methods of implementation.

Available from The Music Educators National Conference
Publicity/Sales Department
1902 Association Drive
Reston, VA 22091
(703) 860-4000
Price: $10.50 per copy; quantity discounts available. Prepayment may be required.

Arizona Visual Arts Essential Skills, 1988.
Based upon three "quality components" of hands-on "Creative Art Expression," "Aesthetic Assessment" and knowledge of "Art in Cultural Heritage." Suggests ways to integrate art education with other disciplines.

Available from the Arizona Department of Education
Central Distribution Services
1535 West Jefferson
Phoenix, AZ 85007
(602) 542-4361
Fax: (602) 542-5283
Price: $2.93; no discounts available.

Dance Curricula Guidelines for K-12, 1988.
Serves as a resource for curriculum design. Includes general foundations for dance education as well as an annotated bibliography of state dance curriculum guidelines.

Available from AAHPERD Publication Sales
1900 Association Drive
Reston, VA 22091
(800) 321-0789
Price: $7.00 per copy; discounts negotiable.

PHYSICAL EDUCATION

The Physically Educated Person, 1992.
Defines a "physically educated student" and establishes benchmarks for physical education. Provides guidelines for skill development, as well as specific knowledge and abilities required at each grade level.

Available from the National Association for Sport and Physical Education
1900 Association Drive
Reston, VA 22091
(800) 321-0789
Price: $5.95; no discounts available

SKILLS DEVELOPMENT

Learning a Living: A Blueprint for High Performance, 1992.
Outlines skills students will need to employ in the workforce and encourages cooperation among employers and schools in defining skill standards.

Available from the Superintendent of Documents
P.O. Box 371954
Pittsburgh, PA 15250-7954
(202) 783-3238
Fax: (202) 512-2250
Price: $6.50 per copy; large quantity discounts available